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FIRST RUSSIAN TEA.

THE TEA PLANTATIONS OF CONSTANTINE POPOFF IN THE CAUCASUS.

HAVING heen closely connected with the tea trade from a very early age, the project of introducing the plant into Europe had long interested me deeply. I clearly saw, however, that before such a scheme could be carried out with any prospect of success, the conditions under which the plant flourishes in its natural habitat, the various properties of soil most favourable to the growth of the tea shrub, and the processes attending the manufacture of tea n China, would have to he closely studied. It was not until 1889 that I was in a position to carry out my long cherished scheme. For this purpose I visited Hankow in 1899 ; thanks to the influence exerted in my behalf by some Chinese friends, I was enabled, n spite of the disturbances then agitating the country, to make a thorough study of the cultivation of the plant, and of the manner of plucking and drying the leaves, as practised in the province of Yung-low-toong. I there worked side by side with the Chinese workmen. Twice suhsequently—viz., in 1891 and in 1893—I visited China. On the first of these two visits to China I turned my whole attention to the flower teas, as well as to the hlack, yellow and green teas of Foochow, studying later on the methods of tea cultivation in Moning and Ningchow. On my third visit to China, in 1893, a visit which I consider as the most satisfactory of all, by its results, I succeeded in studying the culture of tea, not only in the provinces I have already named, but in those of Mankong, Sanho, Ta-sar-ping, Yung-low-see, and Nip-oar-see, observing the progress of the plant from the first buds to the plucking of the leaf, noting the conditions of soil and temperature, the atmospheric phenomena, as well as the methods employed in the culture and preparation of the leaf. Ceylon, Java, the Himalaya district, Japan, the Sandwich Islands, and Assam were all afterwards visited, in turn, more than once. The result f these voyages, and several suhsequent ones, is that I possess ; (*a*) A collection of specimens of the various kinds of soil in which the tea plant flourishes best ; (*b*) An herbarium of the branches of the tea shrub ; (*c*) A collection of the various parasites that infest the tea plant ; (*d*) A collection of tools used for cultivating the tea shrub ; (*e*) Specimens of the tea-leaf in every phase of its manipulation ; and (*f*) Various kinds of manufactured teas.

I have imported on to my estates in the Caucasus:

(*a*) 10,000 tea shrubs from three Chinese provinces—viz., Mankong, Ningchow, and Yung-low-toong.
(*b*) 5,000 tea shrubs from Japan.
(*c*) 500 ,, ,, Ceylon.
(*d*) 200 ,, ,, the Himalaya district.
(*e*) 200 ,, ,, Assam.
(*f*) 50 ,, ,, Java.

Unfortunately, several of the shrubs perished before they reached their destination, I have still, however, 1,257 bushes imported from China, 67 bushes from Japan, 40 from Ceylon, 7 from Java, 16 tea shrnbs from the Himalaya district, and 22 from Assam.

The 1,500 bushes which had arrived intact out of the 10,000 imported from China had cost me, by the time they were landed in Batoum, and I had paid the Customs duties on them, close upon £5,000 sterling.

Moreover, as I was particularly anxious that these plants should he given every chance, I had engaged fourteen Chinese labourers to accompany them to Russia, plant them in my estates,

superintend their growth, sow pure Chinese tea seeds, gather the crop, and manufacture the tea. Messrs. Butterfield and Swire, the owners of the steamer on which the plants were carried as far as Port Said, had agreed to demolish the partitions separating the second-class cabins, thus forming a second deck, and obviating the necessity of their being placed in the hold of the vessel. By this means a sufficient quantity of air and light could be assured.

Whoever attentively examines my tea plantations in the Caucasus may make a very clear comparison between the tea plants imported from the various localities, and anyone versed in tea will find no difficulty in forming an accurate idea of the respective merits of each class of tea.

In 1892 I purchased three tracts of land in the district of Batoum—viz., Salibaouri, Kapreshoum and Chakva, comprising, altogether, about 900 acres, and at once commenced preparing the ground for tea-planting. The three estates differ totally from one another both as regards the nature of the soil and the climatic conditions, a circumstance which enables me to judge what elevation is the most favourable for tea culture in the Caucasus.

Before I purchased them in 1892, the three tracts of land were entirely covered with virgin forests of rhododendrons, wild laurel trees with stems thicker than a man's arm, with beech trees and alder trees, twelve feet in thickness and very tall. Thickly intertwined with furze and thistle, the trees effectually shut off every ray of sunshine, while rendering the forests absolutely impenetrable. Such was the tangled and swampy ground it now became necessary to clear and cultivate.

Not satisfied with having imported plants from China and the other localities before mentioned, I procured large quantities of Chinese seeds, as well as smaller lots from the other places, in order to be able to draw a comparison between them. I am obliged to admit that the seeds from China have been comparative failures, notwithstanding all the measures resorted to in order to induce germination. This unsatisfactory result, always the same after many trials, induced me to try and plant *shoots* from the imported Chinese plants, and this experiment has proved quite satisfactory.

My tea plantations are in my three estates in the district of Batoum; they are: Privolnoe (Salibaouri), Zavetnoe (Kapreshoum), and Otradnoe (Chakva). They are at the following distances from Batoum:—

Privolnoe 3 versts' distance from Batoum
Zavetnoe 6 ,, ,, ,,
Otradnoe 12 ,, ,, ,,

The space occupied by each estate is about:

Privolnoe 120 dessatins (equal to 2 7-10 of an acre).
Zavetnoe 50 ,,
Otradnoe 100 ,,

The three estates differ greatly both in altitude (from zero to 1,150 feet), in their proximity to the sea, in their accessibility to the influence of the sun and of the wind, and in the properties of the soil. My chief aim in purchasing these three estates was to see clearly, by practical experience, the climatic conditions, etc., which are best suited for the culture of the tea shrub in the Caucasus.

The following tracts of land have now been divided into tea plantations, and planted with tea shrubs of various ages:

In Privolnoe there are about 70 dessatins planted.
In Zavetnoe ,, ,, 30 ,, ,,
In Otradnoe ,, ,, 40 ,, ,,

making 140 dessatins in all. I purpose shortly to portion out the rest of available land into new plantations, *i.e.*, about 130 dessatins more.

It is only the seedlings that have been raised from *imported* seeds that are cultivated on my estates; the tea shrubs that have been grown on the estates are not even allowed to flower, much less to turn to seed. Only a few seedlings have been raised from our own seeds, in Otradnoe, by way of experiment, viz.:

In 1898 there were 345.
,, ,, ,, ,, 388.

All the rest of the seedlings have been raised from imported seeds. In reference to the latter, I may add that, in 1893, besides the chief quantum of China seeds, I imported seeds from other lands as an experiment; but none of the seeds except those imported from China yielded sprouts, or at least, if they did, the sprouts all perished.

In 1895 I once more imported seeds from Ceylon, Assam, the Himalaya district, but it was a last and futile attempt, and from that time I have only imported China seeds.

From 1892 up to the present year I have continued importing seeds from China every spring. It has even sometimes happened that I have received a cargo of seeds in the autumn in addition to those brought over in the spring.

In the year 1899 the seeds imported from China yielded about two millions of sprouts, and in 1900 about three millions, in the nursery gardens.

At the present time my plantations contain the following number of tea shrubs raised from seeds:—

(*a*) In Zavetnoe.

Planted in	1893	from	China	seeds	7,228
,,	1897	,,	,,	,,	8,319
,,	1897	,,	Assam	,,	2,464
,,	1898	,,	China	,,	56,600
,,	1898	,,	Himalaya	,,	78
,,	1898	,,	Ceylon	,,	4,102
,,	1899	,,	China	,,	59,052

(*b*) In Otradnoe.

Planted in	1893	from	China	seeds	19,302
,,	1897	,,	,,	,,	35,144
,,	1898	,,	our own	,,	345
					388
,,	1898	,,	China	,,	34,018
,,	1900	,,	,,	,,	284

(*c*) In Privolnoe.

Planted in	1893	from	China	seeds	11,181
,,	1896	,,	,,	,,	5,028
,,	1897	,,	,,	,,	18,655
,,	1898	,,	,,	,,	20,313
,,	1899	,,	,,	,,	210,455

The original tea shrubs have been planted in small experimental patches in my three estates.

At present there are the following original tea shrubs on my three estates:—

(1) From China, Mankong	.. ..	401
,, ,, Ningchow	... ...	447
,, ,, Yung-low-toong	..	409
	Total...	1,257
(2) From Japan	.. ..	67
(3) ,, Ceylon	... ...	40
(4) ,, Java ..	... ...	7
(5) ,, the Himalaya district	... ...	16
(6) ,, Assam	.. ..	22
	Total .	1,409

All the rest have perished.

The bushes mentioned above are distributed over my three estates thus:

(1) In Zavetnoe, Assam shrubs ...	22
(2) ,, Privolnoe, China and Japan shrubs	662
(3) ,, Otradnoe, China, Ceylon, Java and Himalaya shrubs	725
Total..	1,409

In 1894 I tried the experiment of raising new tea bushes from grafts taken exclusively from China bushes. Of these I have now

(1) In Privolnoe	2509
(2) ,, Zavetnoe	1350
(3) ,, Otradnoe	2120

Personally I am inclined to look upon no tea as really genuine but such as comes from China, and, indeed, only from two or three provinces in China, while, as regards the preparation of the tea, hand labour, such as it is practised in China, seems to me infinitely preferable to mechanical labour.

Notwithstanding this preference, however, a preference which has led me to bring Chinese cultivators to the Caucasus at an exorbitant cost, I found myself forced, after several failures, to procure from England the necessary machinery for the preparation of tea, as well as the framework for a new factory.

Messrs. Davidson & Co., of Belfast, furnished me with the apparatus for drying, rolling, fermenting and sorting the leaves, apparatus for cutting and pressing the green twisted leaves, and also a hydraulic press to form the tea into tablets, and another to make tea in the form of a 'pill'

The tea 'pills,' for the preparation of which I had to order a new machine, present, I think, a rather interesting and novel feature. They weigh each half a zolotnik (about 14 to the ounce), and should prove very useful for the army, as well as for sportsmen and travellers. A single 'pill,' steeped in boiling water, is sufficient to give a cup of good strong tea, and I believe that before long these 'pills' will be known and appreciated at their true value.

The first tea I prepared and placed on the market was in 1895; the quantity in the year being, however, only 20 lb. Since then the progression has been rapid. Thus I sold: Tea in packets—

In 1895	20 lb.
1896	37 lb.
1897	1200 lb.
1898	2900 lb.
1899	3610 lb.

In addition I sold in 1898 10,000 lb. of compressed tea (tablets).

The tea in 'pills' has been already shown at several exhibitions, commencing with that held at Nijni Novgorod in 1896, then at Stockholm in 1897, St. Petersburg, 1899, and Paris 1900. They were sold at the Exhibition in Batoum, 1900, too.

As regards the demand for Russian tea and the rapidity with which it is bought up, the only thing I can complain of is the small production, which is far inferior to the demand, owing to the newness of the enterprise and the fact that most of the shrubs are very young as yet.

The entire production of the three qualities I have placed on the market—viz. at 2 roubles, 1 rouble 60 cop, and 1 rouble a pound, has been disposed of in Moscow, St. Petersburg, and Warsaw, as soon as offered. Almost everyone who has tried it prefers it to all other tea, many customers buying 10 lb. at a time, in case they may have finished their supply before a fresh one is procurable.

It would be idle to deny that I am somewhat proud of such results. The examination of my teas from the point of view of flavour, as well as the chemical analysis which has been made of it, have proved that if this tea, grown on Russian territory, be not actually superior to the best Chinese kinds, its quality is in no way inferior. There is therefore every ground for hoping that ere long Europe will accord it full rights of citizenship.

CONSTANTINE POPOFF.

Moscow, 15th May, 1901.

GROWTH OF BALATA PRODUCTION.

There are indications that the production and consumption of Balata are increasing, though at what rate it is difficult as yet to say, owing to the want of system which prevails in most quarters in the statistics kept of this commodity. Mr. Henry Souther Tufts, formerly of Boston, who was a recent visitor to The India Rubber World offices, stated that he was interested in a company employed in the collection of Balata in the section, rich in that gum, due south from Cuidad Bolivar, on the Orinoco, in Venezuela. The company has been devoted to this business alone for a year or more, with such success that more capital is to be employed. Mr. Tufts reports that the Orinoco Co., an American company holding large concessions in the delta of the Orinoco, are also devoting their attention in a large measure to the collection of Balata. It seems that the Venezuelan product is shipped chiefly to Hamburg, owing to the predominance of the German element in the trading in the Orinoco valley. But the German trade statistics do not happen to specify Balata. In the German reports of imports of "Kautschuk and Gutta-percha" the following quantities have been credited to Venezuela, and in the opinion of Mr. Tufts the greater part—or possibly all—is Balata:

	1897.	1898.	1899.	1900.
Pounds ...	103,400	219,780	552,420	773,080

Meanwhile the arrivals of Balata at Rotterdam have about held their own, private statistics supplied by Messrs. Weise & Co. being as follows, and the Venezuelan sorts predominating:

	1897.	1898.	1899.	1900.
Pounds ...	497,970	524,920	324,390	407,220

Coming to Great Britain, the official statistics still include Balata in the imports of Gutta-percha, the latest available figures showing the following results (by converting cwts. into pounds):

	1897.	1898.	1899.
British Guiana ..	538,608	547,120	329,504
British West Indies ...	87,696	136,976	102,928
Venezuela	9,072	32,256	178,864
Colombia	1,563	17,248	53,200
Dutch Guiana	24,976	58,352	..
Total ..	661,920	791,952	664,496

How much of these British imports were actually Balata there is no means of knowing, but presumably all, though the figures for Colombia yet require some explanation. The amounts credited to the West Indies were first imported at Trinidad, mainly from Venezuela.

A summary of the above figures shows imports at the three centers mentioned of 1,263,290 pounds in 1897. Allowing as much for Great Britain in 1900 as in the preceding year, the total for that date would reach 1,644,796 pounds. Formerly the Guianas were almost the only sources of Balata, and figures are at hand covering the exports from those colonies very thoroughly for the earlier years of the industry. These figures show the average exports during the five years 1892-1896 inclusive:

British Guiana	229,824 pounds.
Dutch Guiana	185,472 ,,
Total ..	415,296 ,,

It will be seen, therefore, that the total movement of Balata is taking on greatly increased proportions. It does not appear, however, that the United States have participated in this increase. The official import returns for the fiscal year 1898-99 embraced only 21,913 pounds of Balata, valued at $7633. But the classification is not very exact at the custom house in relation to this material, and for the year 1899-1900 the Balata item disappeared completely. From the reports of arrivals published monthly in *The India Rubber World* it appears that Balata was imported into the United States during the calendar year 1900 as follows (in pounds):

From Trinidad.	From Surinam.	From Great Britain.	From Hamburg.	TOTAL.
30,500	6,900	23,000	17,291	77,691

The leading firm handling Balata, however, state that their arrivals alone were 75,000 pounds, and that probably 100,000 pounds altogether were imported.

The usual methods of collecting Balata are treated fully in *The India Rubber World* for August, 1899,

by Mr. Joubert. It appears, however, that in Venezuela the practice of felling the trees is general, on account of the much greater immediate return, and the area over which the trees are distributed is so great that no possibility of exhaustion is admitted by those engaged in the business. By tapping, the tree can be made to yield only up to the highest point reached conveniently with a ladder, while by felling the tree the sap can be obtained sometimes for a length of 100 feet or more. Besides, under a method used by the Orinoco Co., all the bark is stripped from the tree, after as much Balata as possible has been extracted, and whatever remains in the bark removed by a chemical process. The high price of Balata is accounted for partly by the relative scarcity of labour. As high as 28 cents per pound has been paid to collectors employed in Venezuela, though payment was made in goods. Again, the better supplies of Balata are remote from navigable streams, one company being obliged to pay 3 cents a pound (=$60 per ton) for the haulage of Balata to the nearest boat landing.

Sheet Balata is obtained by spreading the sap in shallow pans and exposing it to the sun, the process lasting sometimes nearly two weeks. The dried sheets are 1/8 to 3-16 inch in thickness, and are sometimes rendered thinner by running them between rollers, the chief purpose of which operation is to render the sheets less liable to curl up. Tin plate is well adapted for Balata pans, though the natives use wooden troughs, lined with tree leaves to keep the gum from sticking to the wood.

Block Balata is formed by boiling the sap in kettles holding from 8 to 12 gallons, until it reaches the consistency of molasses candy at the stage when it can be "pulled." It is then formed into masses in size suited to the packing cases, and placed in water to cool. The boiling requires about 2 hours for the first kettleful; the proper heat having then been reached, subsequent lots are boiled sufficiently in about 45 minutes. The cooling and hardening requires 3 or four hours. Packing cases of wood are usually 18 or 24 by 12 inches, and 4 inches deep.

The new treatment adopted in Vanezuela does not extend to the whole production from each tree, but is rather a supplementary process. That is, after the usual method of extraction, the Balata remaining in the bark is obtained by grinding the bark and removing the Balata by distillation. Only the inner bark is ground up, the rough outer bark being first cut off. The further processes are kept secret, but naphtha is supposed to be used.

The average yield of Balata milk is about 3 gallons per tree, or 27 pounds, which yield 15 to 21 pounds of Balata. Mr. Tufts mentions having removed all the bark from a felled tree, before extracting any sap, and running it between the steel rolls of a sugar mill, with the result of obtaining three times as much Balata, but it contained more impurities than that obtained by ordinary means.

Latest Balata Report from Venezuela.

In the June issue of *Der Tropenpflanzer* (Berlin) appears a report by E. Englehardt, of Cuidad Bolivar, Venezuela, to the effect that during the year 1900 the production of Balata in that country was very largely increased, while the output from the Guianas had become relatively insignificant. The preservation of the trees, he says, has in no wise been considered. They are simply felled and allowed to rot on the ground, although the timber would be of great value if it were possible to convey it to the seaboard. The balata gatherers are compelled to invade the forests deeper and deeper every year, every tree for miles from the original starting point having been destroyed. The only shipments are now made from Bolivar. The rate of increase has been as follows:

In 1897	650,613	pounds.
1898	1,043,170	,,
1899	1,659,295	,,
1900	2,628,784	,,

It will be noticed that these figures, obtained evidently from official sources in the country of production, are much larger than those given in the preceding article, which was prepared before Mr. Englehardt's report was available. It is stated, also, that very little sheet Balata is produced in Venezuela, the block Balata being produced more readily.

During 1900 rubber was shipped from Venezuela only in small quantities, owing to the seat of the revolution which existed for months being in the district whence the necessary labour for rubber gathering is secured. [The rubber from the Orinoco, marketed usually as "Angostura," is of the Para tpye, and classified as "fine" and "coarse."] The shipments by the river Orinoco were: Fine, 114,970 pounds; coarse, 32,332; total, 147,302 pounds. However, some Venezuelan rubber, from the back districts, finds its way to the Amazon, being exported through Para, but the total export Herr Englehardt estimates at not over 100 tons for the year. The production for 1901 is expected to be much larger—possibly 400 tons, owing to an increased interest in the business and the investment of new capital on a systematic basis.—*India Rubber World.*

FLOWERING AND SEEDING OF MANWELL BAMBOOS (DENDROCALAMUS STRICTUS) IN THE CENTRAL THANA DIVISION, BOMBAY PRESIDENCY.

This bamboo known as Manwell all over the Thana district flowered in the Mokhada Hills, which form the western projection of the Ghats over an area of about 3 square miles in the reserved forests of the village of Assa, in December, 1900 and January, 1901, and the seeding occurred in March. The flowering was not entirely gregarious, but very nearly so, and was confined to the mature clumps. A clump here and there seemed to escape. In the Wada Range, which is in the central portion of the district, I observed the flowering was sporadic and scanty. In the Bassein Range on the Sea Coast, the flowering was a little more copious than in Wada, but not gregarious. I an informed that at Yewa, a village in the Kalyan Taluka of South Thana, the Manwell bamboo planted in the village also flowered this (1900) season, and that about half-a-dozen clumps in the forests close by flowered as well. In these cases, the flowering was not confined, it is said, to the mature clumps only, but also to the younger ones. In 1899 I met with a solitary clump of the same species in seed in the Bhiwandi Range of the South Thana Forest division.

Method of Collection of Seed.

While in the Assa Forest, in March 1901, I found the wild tribes gathering the bamboo seed for home consumption, and also for sale in the neighbouring native State of Jawhar. The outer culms of each clump are cut one by one at about 4 feet from the ground, and each culm bearing seeds is laid on the ground, which has been previously cleared and swept. The culm is well beaten with a stout stick till all the seeds from it have fallen. The fallen seeds with husks are carefully collected and winnowed by children. It appears that on being taken home, the seeds are crushed in a mortar. One adult is said to be able to collect 2 to 8 seers, *i.e.*, 4 to 6 lb. of seed per diem. Seed was also collected and sold in the Jawhar State which is adjacent to the Assa Forest at R2 per 16 adholies, *i.e.*, 64 lb. I have a few pounds available for distribution if required.

G. M. Ryan.

—*Indian Forester.*

PRODUCTION OF COFFEE IN INDIA.

After noting that the figures are imperfect and defective, and that, for example, the statistics of the Nilgiri district are very im erfect, the Director-General of Statistics reports as follows:—

Area.—At the end of 1900 there were 245,405 acres of land under coffee in India, all, with the exception of 387 acres, in Southern India. The production of coffee is restricted for the most part to a limited area in the elevated region above the South-Western coast, the coffee lands of Mysore, Coorg and the Madras districts of Malabar and the Nilgiris, comprising 88 per cent of the whole area under tbe plant in India. About 52 per cent. of this area is in Mysore, where there were 128,087 acres in 1900, and the plant is grown on 99,088 acres, being 40 per cent. of the whole, in the British districts of Coorg (68,596 acres), the Nilgiris and Malabar (30,492). In Madras there is no extensive cultivation except in these two districts, and in Salem and Madura. Coffee is also grown, but on a very restricted scale in Burma, Assam, Bengal, and Bombay.

Production.—The fall in prices since 1897 has removed the stimulus which had been given for a few years to the further expansion of the coffee-growing area, while disease has combined with adverse climatic conditions to reduce the yield. The quantity produced last year was but little more than half the quantity produced ten years ago. Taking 100 to represent the area and production in 1885, tbe ratio of yearly increase or decrease is as follows:—

	Area.	Production.
1885	100	100
1886	97	90
1887	103	109
1888	104	76
1889	110	85
1890	114	63
1891	111	13
1892	110	97
1893	109	109
1894	117	101
1895	119	115
1896	121	75
1897	116	69
1898	118	68
1899	115	50
1900	103	62

Persons Employed.—Acccording to the statements there were 22,128 persons permanently, and 91,685 temporarily, employed on the coffee estates in 1900, making a total of 113,813 persons, which is equal to one person to about 2·16 acres.

Exports and Consumption.—The following figures are the average of the ten years ending 1900-01:—

	lbs.
Indian Coffee—	
Production	30,040,608
Exports	30,163,056
Foreign Coffee—	
Imports	1,529,819
Exports	737,520

It is of course not the case that exports have exceeded production during this period; the figures merely illustrate the difficulty of obtaining an accurate view of an industry when those who are engaged in it think fit to withhold information which is indispensable in the consideration of any questions affecting the industry. The fignres, however, imperfect as they are, indicate that the Indian producer of ccffee has no local market on which he can depend for the consumption of any portion of his production. He is entirely dependent upon the external markets which are contained in the countries mentioned below, these being the principal countries to which Indian coffee is exported (in lbs):

	1897-98	1898-99
United Kingdom	12,773,376	17,392,480
France	8,607,872	9,356,816
Ceylon	293,888	505,680
Asiatic Turkey and Persia	863,856	131,264
Australia	199,024	265,440
Arabia	630,896	229,488
Germany	297,584	618,688
Austria-Hungary	591,360	1,023,568
	1899-1900	1900-01
United Kingdom	17,640,000	15,678,768
France	10,847,536	8,430,016
Ceylon	1,224,272	1,088,528
Asiatic Turkey and Persia	137,984	610,288
Australia	272,496	447,104
Arabia	85,232	274,960
Germany	292,544	126,560
Austria-Hungary	298,704	123,312

As France takes on an average about a third of the whole quantity exported, it is obvious that the Indian coffee producer has an intimate interest in the outcome of the question at present under discusssion of the application to Indian coffee into France of a rate of duty higher tban that which is imposed upon Brazilian coffee.

Prices.—Coffee is not sold, as tea is sold, before shipment for export, and therefore there is no Indian quotation of price. The average prices in London for East Indian plantation coffee since 1874 are here subjoined with their variations, taking the price of 1874 as the datum=100. Prices dropped last year, as a consequence of tbe great expansion in the production of Brazilian coffee to the lowest level known:—

	Per cwt. s.	d.	Variation.
1874	92	1	100
1877	110	0½	120
1879	100	10	110
1882	85	4	93
1884	76	4½	83
1887	94	9½	103
1889	99	10	108
1890	106	2½	115
1893	105	4½	114
1894	101	0	110
1897	94	8	103
1898	78	1	85
1899	65	2½	71
1900	48	0	51

—*Planting Opinion:*

Lime for Fowls.—It has not been demonstrated that oyster shells, or lime in any form, produce egg shell or rather shells for the egg, as there are thousands of hens that are in no manner provided with oyster shells. It is true, however, that oyster shells, being sharp, assist in grinding the food. Carbonate of lime is insoluble, and the lime for the egg shells must consequently come from what can be digested and conducted to the eggs through the blood. As nearly all kinds of food contain lime in a soluble form by combination with vegetable acids, as well as in the form of inorganic salts that are soluble, the process of covering the eggs with shells goes without the aid of substances that are insoluble. There is one source of solubla lime, however, that is frequently overlooked—tbe water—which holds lime in a soluble form when it abounds in carbonic acid. Hard limestone water contains lime, and the hens can, by drinking it, secure more lime in a convenient form than from oyster shells. When a hen lays eggs with soft shells the cause is due not to the lack of lime, but to the condition of the hen, as she is then, as a rule, in an over-fat condition. To this cause may be traced all the eggs with soft shells.—*Journal of the Depirtment of Agriculture of Western Australia.*

CAMPHOR OIL.

By Professor Shimoyama, Ph.D.

(Communicated by Our Yokohama Correspondent.)

There is scarcely any need to say that camphor is one of the chief export staples from the Japanese Empire, and according to statistics, during the first four months of this year 1,435,000 yen worth have been exported. The Formosan Government estimates the annual production in that island at 50,000 piculs of camphor and 20,000 piculs of so-called original oil of camphor, the latter containing 50 per cent of camphor. At present two Japanese merchants in Kobe are engaged in redistilling camphor out of the original oil by arrangement with the Formosan Government. In the course of redistillation two grades of red and white oils are yielded. White oil, more popularly known as camphor oil, finds its way throughout the interior, and is very widely used by the Japanese for disinfection; while red oil is exported to Europe and elsewhere to the extent of from 7,500 piculs at the best to 3,500 piculs at the least annually. This red oil of camphor is used in foreign countries for the manufacture of safrol, which is very widely used abroad in the soap and perfume industries; and is also used as a raw material for the manufacture of heliotropin, the price of which has been reduced from 500 yen per kilo, to something like 17 yen per kilo.

About twenty years ago, when no one knew how to use this red oil economically, and distillers used to throw it away, Mr. K. Goto, a merchant in Kobe, made a trial shipment of it, in order to find a market, but without any success at the time. In 1883 Mr. Peltman, of Messrs. Schimmel & Co., Leipzig, Germany, invented a process for making safrol out of it; thus red camphor oil found its way to Europe. In the first instance prices were abnormally low, foreign buyers paying only 3 yen per picul for it. Since then, owing to increased demand, it has advanced to nearly six times the price; present export quotations are from 17 to 18 yen per picul.

Out of a picul of this red oil 50 catties of safrol are produced, so that there is no doubt that foreign buyers were, and are, making enormous profits, as the cost of production is trifling, and they get for safrol 60 yen to 70 yen per 50 catties.

When I visited Formosa in February last year for botanical research, by instruction of the Imperial University, I was asked by Dr. S Goto, Chief of the Civil Affairs Bureau, to submit a report about the manufacture of safrol out of red oil of camphor. Consequently I began an investigation in April, 1900, and completed it by July. A detailed report was submitted to the Formosan Government in November. As a result, it was decided to make experiments on a large scale at a cost of 50,000 yen, and the plant has been laid down in Kobe. The result is satisfactory so far, but when the plant is completed not less than 500 catties of safrol can be made daily. When safrol is manufactured out of red oil a blue-coloured oil is obtained, which I estimate to amount to 1,000 "koku" in a year. After a long research and hard labours I found that it is a very powerful disinfectant. So I named it "Disinfector." A sample of it was sent to the Government Laboratory, and I was informed that it has great power as a disinfectant, and is particularly potent in destroying the plague bacillus. In my opinion, it is a stronger disinfectant than carbolic acid, and will be used widely in the interior. It is a custom of the Japanese peasants to use kerosine for killing worms and insects, which sometimes do serious harm to the rice-harvest; and I believe this "Disinfector" can be used instead of kerosine at a far cheaper rate. The Colonial Government, it is said, is to make practical tests in their experimental agricultural stations. The result will, no doubt, be satisfactory.—*Chemist and Druggist.*

CRUSHING CASTOR SEED.

The 'Dutch mill' is nothing more than two heavy iron uprights connected by two rods on which slide, by means of holes, thin sheet iron plates. One upright carries a screw thread into which a massive shaft, cut into screw form, works. This scrw is actuated by long levers fitting into socket holes in a boss at its outer extremity after the manner of a windlass. The castor seed after being carefully shelled or divested of its black skin, and winnowed so that no black particles remain, is bruised and made up into little packets with thin muslin cloth. These are placed between the plates of the machine, one between each division, to the number of 40 or 50. The screw is then tightened upon them, two men working the levers windlass fashion till the oil is expressed. There is a limit of course to the power of manual labour, and the process does not extract the whole oil, much of which remains in the resulting cake. The shelling and winnowing process demands care, as upon the freedom from the black skin depends the purity of the oil; besides which this skin is of a horny and elastic nature and very resistant to pressure. This matters little under the enormous pressure of the hydraulic, but when manual labour is used the incompressibility of the skin would result in a loss of oil, by reason of the resistance offered to the action of the press.

Although this process is called a cold process, it must be remarked that unless a moderate heat is applied to the plates of the machines to heat the seeds, the oil will not flow freely. Heat is applied in practice by shallow troughs of lighted charcoal placed one on each side beneath the row of plates, but not under the seed being crushed. The 'Dutch mill,' owing to its simplicity, is cheap to construct and easily worked by unskilled labour.—*Indian Gardening and Planting.*

ORANGE AND LEMON CURING AND PACKING.

By A. Despeissis.

Late in the autumn the attention of the grower is turned from his deciduous to his evergreen trees, of these, those which are of greatest importance to him are the trees of the citrus family.

As in the case of the deciduous trees which furnish the summer fruit crop, the choice of varieties to grow is made from a long list, In deciding what varieties to plant, several factors will influence the grower's choice, and, amongst others, the peculiarity of the local climate; the requirements of the market to supply; the character of the soil.

No climate is too warm for trees of the citrus tribe, provided that the parching effect of the torrid atmosphere is mitigated by a sufficiency of moisture in the ground. On the other hand, oranges, lemons and their like, cease to be profitable if grown in cooler climate better suited to the cultivation of pippins or of berries. A few strong trees may be found to thrive excellently under the conditions which prevail in such localities when sufficiently protected, but these are exceptions, from which it would be unwise to draw general deductions.

As regards the susceptibility of citrus trees to withstand hard frost, pomaloes and mandarins come first; they are followed by oranges and kumquats, lemons come next, with limes and citrons last on the list.

A description of each variety of these several species of citrus trees does not come within the scope of this chapter, and the information has already been given.

To the average West Australian grower pomaloes, kumquats, citrous and limes are of as great account. The first three are valuable for their peel, which is candied, whilst limes, and sometimes citrons, are more largely cultivated for the sake of the acid juice of their fruit. As old trees only of these varieties are to be found in West Australian groves, all information referring to the manufacture

of lime juice and to candied peel may well be left out. Mandarins, oranges and lemons are, therefore, of all citrus fruits, those which, having proved themselves well suited to the conditions of soil and climate of this country and to the requirements of our local as well as of our export markets will be reviewed in the following paragraphs :—

MANDARINS.

Of all our citrus fruits mandarins or tangerines are, for the purpose of the local market, the most valuable, the trees are hardy, they bear even when young heavy crops of fruit, they do not occupy much room in the orchard, being dwarf in comparison with other citrus trees. For this reason the crop is easily gathered, the trees are more easily sprayed and protected against the infestation of scale insects—that curse of our orange groves—they are, besides most delicious fruit, easily peeled and greatly liked by everyone, young and old. Our market is at present badly supplied with this fruit, and as growers have, besides, for some unaccountable reason, been somewhat chary in planting them, it is quite unlikely that the demand will, for a long time to come, be satisfied. Nor can the Eastern States supply us with any large quantities of these fruits, as our mandarin season seems to be more protracted over here than it is in the east. Moreover, the fruit is not a very good carrier, the rind being puffy and the fruit tender, and on that account a heavy percentage of the shipments sent over here is lost to the importers.

In order to be profitable, the mandarin tree must be grown on the best of soils, deep, moist and fertile. Of varieties, the best in the order in which they ripen are Parker's Special, Thorny, Queen, Scarlet, Beauty of Glen Retreat and Emperor.

Mandarins can only carry when packed with the greatest care and attention, and when this is done with intelligence, the result is always satisfactory. They are best packed like figs, in shallow boxes, in layers of a dozen each for fruit of the first grade, and eighteen of the second grade, it is not advisable to have more than two such layers. Each mandarin should be wrapped in soft wrapping paper. Some packing houses have their trade mark and name printed on the paper, and as they use large quantities of that material, the extra cost is only nominal. If the mandarins are of especial quality and are meant for a select market, they are often wrapped in tin foil, and packed in neat boxes having an edging of lace paper, with an artistically colored design on the paper cover.

The fruit is, of course, as in the instance of oranges and lemons, carefully clipped and never pulled from the tree, it is allowed to sweat before packing, and none but fruit free from blemish is ever packed.

ORANGES

Are of all the citrus fruit those most extensively planted in this State, where they thrive with great luxuriance. They require good soil, moist, but well drained, and wherever the best varieties are cultivated in congenial locations and are well fertilised, the West Australian oranges invariably supplant the imported fruit on the local market.

Thickness of the rind and sweetness of the juice, as well as abundance of crops, can to a large extent be influenced by manuring.

Heavy dressings of coarse farmyard or pig manure promote thick and puffy rind, and the growth of spongy wood tissue, particularly liable when under unfavourable circumstances to gumming and die-back diseases. Whenever the trees require a dressing of a nitrogenous fertiliser either nitrate of soda or sulphate of ammonia should be given the preference.

Potash fertilisers influence a thrifty growth, a healthy, deep color of both foliage and of rind, and a greater degree of sweetness. For that purpose sulphate of potash, muriate of potash or kainit can be used. When using kainit the dressing should be more liberal than when either of the first two fertilisers are used.

Phosphates increase the productiveness of the trees and the general excellence of the fruit. Either bone dust, phosphatic guano or Thomas' Phosphate give very good results. When it is intended to benefit more particularly the current season's crop, superphosphate of lime, which is more soluble than the other phosphatic fertilisers, applied in the late winter, or as late as the early spring, will be found most useful. Two to six lbs. of these fertiliizers, according to the size of the trees, constitute a very good dressing.

Unlike lemons, which should be picked before they turn yellow, oranges are always better when left to hang until ripe and sweet. There is a degree of ripeness however, which, if over-reached, proves detrimental to the long keeping of oranges.

Nothing but the best fruit, absolutely free from scale insects will carry and open satisfactorily when marketed. Fruit trees cannot carry a heavy crop and sustain large colonies of scale insects at the same time.

For picking the fruit some growers twist the stalk until it snaps; fruit thus plucked have a poor chance of keeping. Clippers that will not injure the fruit should be used in preference to a knife. The stalk is cut short, just above the star; if cut too long, it will probably puncture some of the fruit in the case and thus engender decay.

Some orchard hands when stripping a tree place the fruit in a turned up apron fastened over their shoulders and round their loins; this plan is not to be recommended, as the fruit rolls about and thus gets more or less bruised; light buckets are most convenient for that work; they can be hanged until full to the step-ladder and then lowered and emptied in boxes with open salts and there left to sweat until packed for market. These boxes are filled so that one can be placed on the top of another without the oranges below being crushed by the case above.

If a spring cart is not available for conveying the fruit to the packing shed, and more especially if the road be rough and uneven, a bedding of straw in the bottom of the dray will save the fruit from being bruised. When freshly picked the rind of oranges and lemons is indeed brittle and its cells filled with moisture, essential oils and air.

After standing a few days, beads of sweat can be seen on the rind, which then becomes smoother, more pliable and leathery and less liable to be bruised by pressing in the case.

When properly sweated, which will take three to four days, the packer handles each fruit, wipes it dry and grades it according to size and quality. Fruit picked after heavy rain takes longer to sweat and is more easily bruised. It is then wrapped in a piece of tough but soft tissue paper, the four corners being gathered up at the stem end and twisted, thus acting as a spring buffer which saves the fruit around from possible bruises. The paper should not be too large, and of course varies in size with the size of the fruit; that more common dimensions being 9 x 9 inches. 10 x to 10 or 10 x 12 inches.

This done, each fruit is firmly set in its proper place in the case, tier upon tier. Should the last layer rise above the edges of the case, quarter of an inch or so, so much the better; the lid is placed on top and pressed down gently and firmly and nailed down. Oranges packed in this way, will not, when opened on sale, be found as several cases of otherwise choice fruits despatched last season to the Agent-General in London, to have "too much paper, be of mixed size, and slackly packed," but they should carry in good condition even as ordinary cargo.

The cases should be made of light and well-seasoned wood, stowed away under shelter until used, so as to protect them from weather stains, and the name or trade mark of the grower, the grade of the fruit, and number in the case should be neatly stencilled on the end pieces.

Two defects should be guarded against with fruit cases. They should not be made of such wood as

might impart to the contents an unpleasant flavour, and they should not be constructed of too flimsy material. When the slats are less that ¼ in. in thickness, and especially if these slats are wide, the cases are often damaged and go to pieces when slung in loading and unloading, and much fruit is in consequence injured or lost. A trifling saving may possibly be made in first cost of the thinner packages, and pounds' worth lost in the end on the consignment.

LEMONS.

A few notes on lemon curing will end this chapter. A number of new methods have been propounded for curing lemons by enthusiastic experiments and the results have at times surpassed the most sanguine expectations, and at other times proved disastrous. When all is said and done, the only secret in the art of curing lemons consists of no more than careful handling.

Several desiderata, when found combined, ensure profit to the lemon grower, and unless these are secured there is no money in lemons, which are imported in large quantities from the Mediterranean ports in the height of summer, when they are most required, and sell at a comparatively low price.

The first of these is suitable soil and climate, then come suitable varieties, careful picking and handling, and long storing.

The best soils for lemons is a loose, deep, and well-drained loam, moist and fertile; it also does well on coarse granite soil, intermixed with a sediment of rich sand, but in these soils will require irrigation oftener than in the heavier soils.

Except in the more arid localities, irrigation is deprecated for the first two or three years, so as to force the tree to send its roots deeper into the soil in search of moisture and of nourishment. The wisdom of this treatment is made more apparent in the matter of both water and fertiliser in after years, when the trees are in full bearing. Early irrigation also stimulates an already excessive tendency on the part of the lemon to make too rapid a growth of wood.

The cultivation amongst the lemon trees, as indeed amongst all citrus trees, should be frequent but shallow, as the roots are mostly surface feeders, and too deep cultivation would tear them to pieces.

A climate moist and warm suits the lemon best, as the tree is susceptible to hard frost and loves moisture.

As to varieties, the list is a long one, but three or four stand out prominently, each having its advantages as well as its disadvantages, viz., the Eureka, the Villa Franca, and the Lisbon. Of this last several strains are known, good, bad and indifferent, and every care should be taken, when propagating by buds, to ascertain the merits or the defects of the parent plant.

Picking is the essence of curing, and when lemons have been rightly picked, they will with ordinary care keep for a long period.

All lemons which have reached 3 to 4 inches in diameter, those that have already turned yellow, or show thorn pricks, those that have been punctured by scale insects, or are soiled by the sooty mould, are not fit for curing and long keeping, and should be sold to the best advantage and without delay.

The lemon tree blooms and sets its fruit continuously all the year round, although in the early spring and the late autumn more especially the picking is heaviest. The tree it is known makes in favourable seasons several growths in the year, and likewise produces two main crops, with a few stray lemons in between.

For curing, the autumn pick of lemon is the best. This is done not all at once, but the trees are gone over several times, and the fruit picked as it reaches the right degree of development. At that time the skin is perfectly smooth and the end is filled out; before this time there seems to be a little depression or a little ring at the end. When this stage is reached the rind is thinner and less puffy than later on, the juice cells are tender and gorged with acid. The months May and June in Australia are the best for picking lemons for curing. The fruit should be picked when still green, with just a tinge of yellow showing. They should be stem cut and handled as carefully as has been mentioned in the case of the orange.

The sizes most suitable for the market are those ranging between 2¼ to 3 inches transverse diameter. Some people use a ring for the purpose of measuring the fruit, and every lemon that just goes through is clipped, the eye, however, soon gets trained to the size required, and when in doubt, the forefinger and the thumb round the lemon will, if they nearly meet at the stem, approximate the size wanted.

When picked, the lemons are placed in the sweat boxes, as described above when speaking of oranges and there left for a week or so.

The size of the sweat box is of no special importance, but it should be shallow and not more than 9 to 10 inches deep, with a few slits on the side to allow ventilation, and check the growth of the moulds of decay.

Packing is done when the skin is dry, clear and smooth. Several grades are made, each fruit is handled separately and none but those absolutely without blemish are wrapped in tough tissue paper and cased for long keeping.

When it is intended to store for a long period, the sorted and graded fruit may be placed on shallow trays superposed one on the top of the other in a cool, dark room, with sufficient ventilation provided to carry away the foul gases and the moisture thrown off the lemons. In this way they will keep through the winter until the approach of the warm weather in the early summer. A cool temperature is maintained in the room by opening the door and window at night, and closing them in the day time if found necessary.

Some packers place the fruit from the sweating boxes into barrels or large cases, and run over them fine dry sand and thus leave them until they are marketed when the demand sets in later in the year.

Other packers anoint each lemon with a light film of vaseline. For that purpose they rub the fruit all over with a piece of flannel with the vaseline on. It is claimed that vaseline never becomes rancid and is tasteless and odourless, and after a few weeks it is difficult to pick out the fruit that have been thus rubbed with vaseline, as by that time they have lost their oily and shining appearance. Vaseline checks the growth of moulds of decay and prevents the skin drying up too quickly. Some use steam for colouring the lemons, but the process is not to be recommended. Others dip their lemons in some antiseptic fluid and thus keep them sound for a long time, but lemons thus preserved, although bright and fresh when fresh from the dip, soon turn brown and show a horny rind.

In conclusion the art of curing lemons consists in:—

Growing the right kinds.

Manuring, cultivating and tending the trees well and maintaining them in a state of health and thrift.

Picking at the right time and in the proper manner as where the stem is pulled from the lemon the cells are exposed to the air and decay sets in.

Sweating and grading; storing in a cool, dark place. Specially constructed storing sheds have been constructed for keeping cured lemons in, but any ordinary chamber answers the purpose just as well, provided it is not damp or too much exposed to sudden changes of temperature. Such a chamber should be dark and well ventilated.

The lemons are marketed as are the oranges, and in connection with our local market it may be mentioned that the best months for handling the local crops are September and October, and before the November-cut main crop of Sicilians come in, and also in April and May, after the Sicilians are done, and before the cold winter stets in.—*Journal of the Department of Agriculture.*

PRUNING

By A. Despeissis.

In previous chapters the general principles of pruning vines, and also fruit trees, have been dealt with. In this issue the consideration of the best ways of training and pruning a few more of the fruit trees generally cultivated in our orchards is proceeded with.

Pruning the Cherry.

The instructions given about the shaping of young trees apply to the cherry. The stem should be low and headed back to 12 to 15 inches when planting; the main limbs are also cut short, as the tree is very subject to sunburn. To guard against this it is a good practice to pinch all side shoots not necessary for the extension of the tree to a pair of leaves or two; fruit spurs will thus in time be formed all along the lower branches, while these tufts of leaves will afford to the branches protection against the sun.

Cherry trees in general produce their fruit upon small spurs, or studs, from half-an-inch to two inches in length, which proceed from two, three, or four year old wood. New spurs will continue to shoot out right up to the extremities of the branches; in the centre of every cluster of fruit spurs there is a wood spur, which, as it extends each season, bursts into blossom and carries the year's crop; this should be remembered when pruning. These spurs will carry fruit for several years.

Once the cherry tree has commenced to fruit it should, unlike the peach and the apricot, be very sparingly touched with the knife, as it is besides very subject to "gumming." This peculiarity of the plant is aggravated in individuals presenting long stems exposed to the sun, on trees with many forked limbs, and on those which have had large limbs taken off. It is found that by doing all the necessary severe cutting during the summer, and after the crop has been gathered, the wounds heal more readily. Whenever a branch thicker than the size of the finger is cut off it is advisable to apply to the fresh cut a covering of white lead, gum shellac varnish, of hot wax or of clay.

The *Heart* and *Bigarreau* sorts, which are sweet varieties, are luxuriant growers, attaining large size, and possess large drooping leaves. Mazzard stock are preferred for these, the trees being long-lived, larger and healthy when planted on fairly good loam.

The *Duke* and *Morelloss* classes are slow growing sorts of the sour kind. The first have stiff and erect branches with smaller leaves, thicker and of a darker green color than the preceding classes; the second or Kentish Cherries are of a bushy habit, with smaller leaves still and more drooping and more numerous twigs. The branches must be kept far enough apart to admit the sun and air freely amongst them, and the stem and main branches strengthened by cutting hard for several seasons. If the tree grows too luxuriantly, an occasional root pruning will throw it into fruit. They do best on Mahaleb stock, which gives smaller trees, but is more accommodating as regards soil. This stock gums on wet, retentive soil. If it were not for the sprouting habit, sour varieties on their own roots do very well. Cherry trees when shaped for the first few years as a rule keep a good form, and bear well without pruning.

Pruning the Filbert.

Suckers should be carefully eradicated every season, and the bushes pruned somewhat after the fashion of the quince, or else they will be a mass of branches, and remain almost barren. Yet the filbert, in the majority of cases, is completely left to itself, although to be fruitful it requires proper and regular pruning. The blossoms, like those of the walnut, are monœcious, *i.e.*, the male flower or catkins, and the female flowers are borne on the same tree, but from different buds. These fruit buds bear in a cluster at the extremity of small twigs, and are produced on shoots of one year's growth, and bear the next.

Unless the bushes are pruned, they bear very heavily one year, and remain barren several seasons to recuperate. The mode of pruning consists in cutting back severely the first few years, so as to favour the growth of side shoots, which are shortened to prevent the whole nourishment being carried to the top of the branch, the consequence being that small shoots grow from their base, which carry fruit. By this method of spurring, bearing shoots are produced, which would otherwise have remained dormant.

Pruning the Walnut and Chestnut.

Much of what is said about the pruning of the fig applies to these trees. Their habit of growth is symmetrical, and the growers will, by cutting off misplaced branches, broken or dead, and by shortening bending limbs, do much to keep them growing symmetrically. As their feeding roots are close to the surface, light hoeing only should be done in close proximity to the trees. They should be trained with a general upright tendency, so as to interfere as little as possible with cultivation. Limbs branching low down will protect the stem from sunburn.

Pruning the Loquat.

The loquat, or Japanese medlar, has hitherto been raised from the seed as a tree suitable for wind breaks. The choicer varieties are, however, now propagated by grafting or by budding, either on its own roots or on the quince, to which it is botanically somewhat related. In the first instance it forms large trees, which take four or five years to mature its fruit. In the second instance it comes into bearing at an earlier age. When grown for shelter the higher trees worked on loquat seedlings should be selected and trained with a stem 3 or 4 feet high. In the second case, whether it is on its own or on quince roots, it should be headed lower down. As the tree carries permanent foliage, and later on heavy crops of fruit, the main limbs should be as strong and sturdy as possible, and trained with a generally upright direction. These in course of time, as the branches extend and carry more foliage and more fruit, will gradually be bent down, hence the importance of throwing strength and vigor into them at an early stage. This is done by encouraging the growth of three or four leaders, low down on the stem (if not grown as a wind break); all other shoots are either cut off or pinched back, and the young tree is subsequently shaped much in the same manner as has been explained in connection with the shaping and framing of young trees generally. The fruit bunches issue from the terminal points of young shoots. They bear at their base wood buds, which will in growing season push out young shoots. These, if too numerous, should be thinned out to two or three only, so as to insure for each its due share of light, air and sun. The decaying flower stalks are cut off, as well as also all dead branches.

Pruning the Fig.

Fig trees naturally form symmetrical heads. They are best shaped when young with the main arms arranged symmetrically round the stem. Figs for table purposes are headed low, so that the fruit can be picked without difficulty. Figs for drying are headed higher, so that the picking of the dead ripe and fallen fruit can be easily done over the smooth ground. The fig tree suckers pretty freely, and these should be removed in the winter time. Wherever the ground is rich the tree will often run excessively to wood, and in that case root pruning will force it into bearing. Drooping branches are cut off, and those growing obliquely upright retained. Dead wood and branches that cross and interfere with one another are suppressed, but the end of the shoots should be sparingly touched with the pruning knife on account of the mode of bearing of the tree. This is as follows;—The fruits are

by the daily turning over of the adjacent soil and the addition of clean earth to it. But even on freshly trenched land the method of planting on mounds, as described above in connexion with wet lands, has given very good results. Another mode successfully employed has been to have the trenched land turned over, ploughed if possible, several times in succession at intervals of say a week, or if time does not allow of this, to have the pits for transplanting dug and left open for a day or two, then lightly filled with clean earth up to the surface and a little higher, the young plant being put down so that its roots do not at once come in contact with the crude manure. Growth in such cases is comparatively rapid, as will be seen from the statement attached, giving the height and girth of trees of different ages. The statement of stock in the plantation does not include the fresh supply above referred to, no plants having as yet appeared above ground, 6700 pods were received and opened for planting, giving 20,100 seeds or thereabouts. These were sown without delay. I am reporting on them separately after a reasonable time has been given for seedlings to come up.

5. *Species other than Hevea.* There is abundance of Ceara (*Manihot glaziovii*), and in response to a request of the Director of Agriculture I havo forwarded a Wardian case of it to the Superintendent Northern Shan States for experimental cultivation. In the same case I have sent a few specimens of Para rubber, but whithout much hope of their thriving in so extreme a climate. The Superintendent having been kind enough to offer, when returning the Wardian case, to give me a supply of plants obtainable there, I have asked him for *Ficus elastica*—a tree I think might be successfully grown on the higher land in B Block of this plantation, where *Hevea* has not done well.

I have two remarkably healthy specimens of *Castilloa*, and if the seeds you have been kind enough to order for me from Trinidad do as well, I should be inclined to suggest that this plantation be devoted mainly to *Castilloa*, leaving the culture of *Hevea* on a large scale to be dealt with at Mergui, where the climate undoubtedly suits it better. This of course assumes that we get the true *Castilloa*—the Mexican *Hule*, and not the Panama *Tunu* which has proved worthless in Ceylon and elsewhere. Reports from Trinidad shew that they have secured the real *Castilloa elastica* there.

Two specimens of *Payena Leerii* are also thriving, and in fact so closely resemble many indigenous jungle-plants that I should not be surprised to hear that this gutta-percha yielding plant is after a native of Burma, as well as of the straits and Borneo.

Of creepers from Africa (*Landolphia Kirkii* and *Vahea Senegalensis*) I have a fair stock. They give no trouble, and look healthy.

6. *Roads and Buildings &c.* There is not much to be noted under this head. A Norton's tube-well was sunk at a cost of Rs. 65 and water found. A new Road has been made by the P. W. D. from the Kokkaing main road about a mile south of the plantation gate, to the village of Kambe. This will be useful as a second approach to the plantation and to the land purposed for its extension.

A mounding-mill, for the conversion of nightsoil into manure without the delay involved in trenching and waiting upon nature for the completion of the process, is under construction. I do not expect it to be of much use during the rains, but in the dry weather it should be capable of providing all the manure the plantation requires, and in a more portable and cleanly form. Manure prepared by this process is almost inodorous from the first.

7. *Experiments.* I have submitted about twenty trees to marcottage. Of these, six have thrown out roots, and cuttings have been detached and planted in the nursery. So far they are doing well, but past experience is not encouraging as regards reproduction from cuttings. Last year's cuttings of which in your remarks on my report you asked that a careful record should be kept, did very well for about three months after they were put down, then (during my absence on leave) sickened and died. Being the rainy season it could not have been for want of water. Possibly they had not the vigour necessary to resist the weeds and the jungle surrounding them. The present cuttings will be given a better chance by planting them in prepared soil.

As regards our experiments in root-grafting upon cuttings, you have yourself noted their want of success. I do not think it desirble to sacrifice well-grown trees for the sake of a few doubtful cuttings, so have not continued the experiments.

Cost of the Undertaking.

Receipts.

		R.
To	Unexpended Balance from last year (1899-1900)	435
„	Grants received during year ..	2,381
„	Sales of grass	3:11
	Rs.	2,819,:11

Expenditure.

		R.
By	Cost of Fencing	629
„	Tube well	65
„	Labour...	838
„	Contingencies (tools &c.) ...	138:10
„	Balance in hand	1,670:10
„	Balance in hand	1,148: 1
	Rs.	2,819:11

The following rates were given for works done:—*Fencing*—composed of three strands barbed wire, or two strands and a top rail, on *pyingado* posts 10' apart, 1653-1/3rd yards at 6 annas 1 pie per yard.

Tube Well—consisting of pump, five sections tube, and driving point Rs. 51:12, commission annas 4 and labour Rs. 15; total Rs. 65.

Cost per acre—Rs. 56:4. *Cost per planted out tree*—As 8:8 *Stock of Heveas.* Opening Balance 2159+1201=3360—628 dead=2732 in hand. Failures heavy on account of cuttings.

Stock of Rubber Trees on 1st July 1901.

Block and Species.	Para.	Ceara.	Other.
A Block.			
Para (Hevea Braziliensis) ..	866	...	...
Ceara (Manihot Glazivoii) ..	..	96	...
Mexican (Castilloa elastica) ..	...	..	2
Burman (Parameria glandulifera)..	..	..	2
B Block.			
Para	240	.	...
Coara	...	103	...
Gutta percha (Payena Leerii)	..	...	2
C Block.			
Para	187	..	..
Ceara	..	70	...
African Creepers:—			
Landolphia Kirkii	...	..	51
Vahea Senegalensis ..	..	..	5
D Block.			
Para	771	..	..
Ceara	..	24	..
Total Trees ...	2732	293	62

Selected Measurments,

Height of best trees Para only	Girth at 3' above ground	Date of sowing from seed	Notes
14			
14	3/.5 in.	Oct. 99	In A. Block. Raised in nurseries Kambe, and transplanted to present site--trencbed land. Comparatively rapid growth due to proximity to open water, and to good drainage at roots.
6'	1.75 "	do 1900	
5'6"	1.5 "	do do	
9'6"	2.5 "	Sep Oct 1899	In B. Block. Seed raised in nurseries Kambe, and transplanted when 3' high to present site. On trenched land with a poor natural soil.
9'	2.5 "	do	In C. Block. Planted at stake in present position and land subsequently trenched over.
12'	3 "	Oct 98	In D. Block. Seed planted in nurseries Rangoon. Seedlings carted out 4 miles when from 2' to 5' high. Put down in pits in unprepared soil,
11'6"	3.75 "	do do	
11'	2.875 "	do do	This tree was over 5' high when transplanted. Has suffered from exposure to high winds.
8'	2.5 "	do do	

J. A. WYLLIE.
Major I. S. C.
Secretary Cantonment Committee, Rangoon

From F. B. Mansou, Esq., Officiating Conservator of Forests, Tenasserim Circle, to the Revenue Secretary to the Government of Burma,—No. 1092, dated the 17th July 1900.

WITH refcrence to correspondence resting with your letter, Forest Department No. 401-4R.—1, dated the 17th April 1900, relating to the small plantation of India-rubber at kambe, beyond Kokkaing, I have the honour, to forward, in origiual, Major Wyllie's letter No. 47-6, dated tbe 6th July 1900, with three enclosures, this being his first annual report.

2. I have recently visited the plantation and beg to offer the following remarks:—

Paragraph 2.—The shedding of lcaves in the cold weather is only natural.

Paragraphs 3 and 6.—A continuous fence is, in my opinion, necessary for excluding cattle. Until this can be provided, the barbed wire fence of the original plantation, namely, the square on D, D 10, D20, D 30, has been utilized to protect those parts of the boundry most in need of it.

Paragraph 7.—The trenching operations will doubtless be beneficial to tbe rubbcr plants, and are not so offensive as I expected.

Paragraph 9.—The plantation has beeu neatly laid out and the oompartments are being numbered.

Paragraph 10—The sowing of seed at stake has not been so successful as raising plants in nurseries, bnt there can be no doubt that the seed was of poor quality. The seed put out at stake was probaly also more subject to the depredations of rodents.

Paragraph 13.—Tbe propagation of *Hevea* by cuttings should be continned, a careful record being kept of the number of cuttings put down, the percentage of success, and remarks standing any abnormal conditions affecting the result.

The plantation has been made for the most part in scrub jungle, but partly on cleared land covered with truf. On tbe latter it is known to be difficult to raise forest trees owing to tbe absence of shelter. Tbe covering of turf is also disadvantageous. If labour can be spared, the turf should be hoed up around the *Hevea* plants to aerate tbe soil. The plants which have been put down in the juugle look healtby, but they must have head room. Overhanging brauches must be cut back, and the plants be kept free from creepers.

Paragraph 15.—It is a pity to plant *Ceara* in the place of *Hevea*, except it be to provide shelter for *Hevea* which will be planted later.

Paragraph 16.—An order has been given for the plants referred to in your lettter No. 401-4R.—1, dated 17th April 1900. *Hcvea* and *parameria* seeds will be ordered from South Tenasserim.

Paragraph 17.—This shows that a satisfactory beginning has been made.

Paragraph 18.—The arrangements appear to be quite satisfactory. Receipts to the extent of Rs. 100 are already shown, and the sale of fodder grass may bring in some more revenue.

Paragraph 19.—The men seem to be good workmen, and I understand that the mouey advanced for their journey from Madras is beiug recovered.

Paragraph 20.—Tbe masonry well should be made as soon as possible for irrigating the plantation in dry whether.

Paragraph 21.—The area of the plautation is small. It will be an advantage if it can be exteuded hereafter. A larger plantation could be more economically mauaged.

3, If Major Wyllie's report is printed, I should like to have ten copies.

From Major J. A. WYLLIE, Secretary, Cantonment Committee, Rangoon, to the Conservator of Forests, Tenasserim Circle,—No. 47-6, dated the 6th July, 1900.

KAMBE RUBBER PLANTATION.

I have the honour to submit, as tbe annual report for the first year of experimental cultivation:—

(i) Extracts from notes of stock taking, in continuation of those accompanying my No. 93-6, dated the 10th October 1899.
(ii) A plan showing actual progress of planting operations up to date; and
(iii) Statement of the labour employed.

2. From the figures in statement (i) it will be observed that the young plants put down in the original 2-acre enclosure (737 in uumber) did well up to the close of 1899. But at January's stocktaking this year many were found sickly and apparently in want of special watering, shading and manuring. I accordingly took on some extra hands, and by giving individual attention to each plant in turn a fair number were induced to put forth fresh leaves. Others were saved by transplanting fresh pits being dug to a depth of 18 inches and filled in with manure. Where the natural shade of the jungle was insufficient, gabions to serve as shaed and wind screens were placed round each tree.

3. Between January and July the original enclosure was gradually planted up to its full capacity with seedlings of *Hevea* from a nursery (raised from seed planted early in September 1899). It will soon become desirable to move two sides at least of the fence you put down in July 1899, so as to form a plot 500 feet by 500 feet and thus accommodate (at 10 feet by 10 feet intervals) 2,500 trees in all. The present capacity of the enclosure is 900 trees.

4. You will see from my letters Nos. 148 and 149-6, of the 8th February and 16th March 1900, that the extension of the plautation up to the south-eastern boundary of the Military cholera camp (minus a small portion specially asked for by the

Executive Engineer, Construction Division, to give access from the camp to the Kambe tank) has been arranged for; also that the Deputy Commissioner, Hanthawaddy District, has assigned for tamporary occupation by the Forest Department a portion of waste land lying between the west edge of the "dangerous zone" aud the Kokkaing high-road. This I have added to the area under cultivation and planted it up from last September's seedlings on the lines shown in plan (ii).

5. *Roads, fences, and buildings.*—Through the extended portions of the plantation I have cut (and partly completed) cart-tracks, taking off from the high road at the south-west corner of the additional land assigned by the Deputy Commissioner. With that officer's permission three huts have been erected beside the first cart-track, one as a store, the others as dwelling-houses for the gardeners and trench-coolies employed in cultivating and manuring the land. At the Deputy Commissiouer's suggestion I have marked each hut distinctly to show that it is Cantonment property aud not to be taken as the occupant's own. This should defeat any attempt to prefer squatters' claims hereafter.

6. Two streams crossing the cart-roads have been bridged by wooden culverts, paid for as Cantonment conservaucy works, as they serve mainly for the passage of the Cantonment night-soil carts. As regards fencing-in, the southern limit of the plantation has been left indefinite for reasons which I will explain at the end of this report, but temporary fencing is being carried out on all the other sides, quick-growing trees having been previously planted to mark the line for a permanent hedge. Belts of these trees have also been planted wherever the existing jungle is so thin as to expose the *Hevea* to damage from high winds.

7. *Manuring.*—As arranged prior to yonr departure on privilege leave, the night-soil trenching of the Cantonment is now being carried out ou the planted as well as the unplanted land. I have submitted a full report of the methods employed to the Cantonment Committee (Meeting of 9th March 1900). Where risk of injury to the young trees might result from the passage of the carts, the manuring is done outside on the *mounding* system, *i. e.*, the night-soil is mixed with dry earth and stirred till it becomes an inodorous, clayey mass, when it is spread out to dry and removed in baskets to be worked into the soil near each tree.

8. The unplanted lauds are being prepared by the ordinary method of trenching, filling, and covering with earth. Similarly, with the land intended for nurseries and for cultivation otherwise than with rnbber (some portions are unsuitable for rubber-growing), except that fresh wood-ashes and leaf-mould are added after covering the trenches. Tho results of manuring, so far, seem satisfactory. On the 7th ultimo the plantation was inspected by Major Davies, R. A. M. C., Bacteriologist with the Government of India, and Colonel Branfoot, C. I. E., Principal Medical officer, Rangoon district. These officers noted and, I believe, approved from a sanitary point of view the arrangements made for combining sewage-disposal with cultivation. I trust the scheme will meet with the approval of the Government of Burma.

9. *Laying out of the plantation.*—*Vide* Enclosure (ii). Parallel lines 100 feet apart run throughout the length of the area taken up, crossed at right-angle every 100 feet by similar lines, thus dividing the total area into squares of 100 feet side whenever possible. On either sido of every such line or cross-line the jungle has been cut back to a depth of 5 feet, thns leaving a 10 feet lane. Starting from a point 5 feet from the intersection on either side of the central line a pit has been dug and a rubber tree planted. By this means a path has been kept open for the gardeners, retaining the back-ground of original jungle as shade for the young plants. As the trees come to maturity and seed, it is likely that spontaneous seedlings (as at Mergui) will spring up, converting the sides of the 10 feet land into a nursery for the adjoining square of jungle. That square can then be subdivided into four squares of 50 feet side, and the dividing lines planted on the same plan. These again can be further subdivided and planted up until the minimum interval of 10 feet by 10 feet is reached.

10. You may remember (*see* parsgraph 4 and 5 of my report No. 93-6, dated the 10th October, 1899) our planting out at stake, between the 31st Augnst and 5th September 1899, 3,780 seeds of *Hevea Braziliensis* on unprepared land. It was arranged that these plants should not be tended in any way, but simply left to nature, as an experiment made to ascertain whether *Hevea* forests could safely be started on such a plan. From these seeds I regret to say only 32 plants are now in existence.

11. This result was not altogether unexpected, as the seed in question was doubtful, having been kept too long before it reached Rangoon. But, as I succeeded in raising nearly 25 per cent. of plants from the same consignment of seeds, planted under shade in a prepared nursery and watered daily, the age of the seeds, is evidently not the only reason for the failure.

12. The few trees remaining from this experiment, have only been saved by artificial shading, watering and manuring. Of 75 trees found alive on the 1st January 1900, the heat and drought of February and March have killed 43. It may not be correct to condemn planting out at stake as a means of forming *Hevea* forests elsewhere in Burma, on the strength of this series of observations, but the results of nursery cultivation are clearly more satisfactory as far as Kambe is concerned.

13. I have tried the reproduction of *Hevea* by cuttings a method which answers admirably for *Ceara* rubber, by the way. Of my experiments in *Para* rubber I can report 56 snccessful, 56 doubtful, and 121 failures. The uncertainity of the rains this season has led to an unnsnal number of failnres among newly transplanted seedlings, so that the cuttings, come in opportunely to fill blanks. I find it necessary to arrange for artificial shading whenever a seedling or cutting is planted ont, unless the natural jungle happens to be very thick. As the trees grow, the jungle can be cut back, bnt to what extent it is advisable to clear the undergrowth will be matter for future observation. I must say, however, that where weeds and under growhh among the plants here have been removed, none of the bad results observed in Ceylon and elsewhere have followed.

14. There are now in the plantation—

Hevea trees of first planting (July 1899 ...	696
Hevea trees of second planting (Sep, 1899 ..	32
Hevea trees put down to replace dead trees...	29
Hevea seedlings of 1899 planted cut 1900 ..	1,169
Hevea cuttings do do do ..	233
Total trees of *Para* rnbbber .	2,159

15. *Ceara rubber (Manihot glaziovii.)*—The stock of seedlings and cuttings this year is a fairly large one, so much so, that in planting out I may have to eucroach to some extent on the land reserved for *hevea.* I have marked ont a nursery at Kambe for the propagation of this tree, and stocked it from cuttings of the young trees planted last year, and of older trees in the Cantonment Gardens. This is a very hardy plant and requires on special care. I can easily make a large stock of young plants available, should Conservators of Forests in Burma or elsewhere require supplies.

16. *Other rubber trees and vines.*—The seeds fo *Castilloa* ordered by last year have not yet been received. The same remark applies to the *Mangabeira* rubber, for which an order has, I understand, been

sent to Brazil by your *locum tenens*. The folliclea of *Parameria glandulifera* sent me by you on 18th July last have produced nothing. I have ordered seeds of *Chavannesia esculenta* to be collected and planted under the wild mango trees in the centre of the plantation. There are about 25 or 30 specimens in the Cantonment Gardens, planted by me in 1896, and doing fairly well, but they have not yet fruited.

17. *Area taken up.*—Gross acreage 32·14 acres. Deducting unsuitable or otherwise occupied land 4·5. Net acreage for planting 27·64 acres. Planted as follows :—

Block.	Contents.	Stock, 1st July. *Para.*	*Ceara.*
A	*Para* on 100 feet lines, part planted.	625	..
	Ceara on northern triangle not yet planted. Southern belt part planted ..	..	40
B	*Para* on 100 feet lines, part planted.	186	...
	Ceara on Southern belt, planted 10 feet by 10 feet	..	180
C	*Para* on 100 feet lines, part planted	468	...
	Ceara not yet laid out for planting	...	..
D	*Para* on 300 feet by 300 feet fully planted at 10 feet by 10 feet intervals. Rest of block planted on 100 feet lines	880	..
	Ceara scattered trees on fence line	..	30
	Total trees	2,159	502

This calculation is exclusive of dead and doubtful trees and of nurseries containing about 60 *Para* and 1,000 *Ceara* trees to be planted out shortly.

18. *Establishment.*—The grant sanctioned by Government for the current year is Rs. 500, with a promise of its increase, if necessary. To the amount drawn may be added a sum of, say, Rs. 100, the yield of land included in the plantation, but unsuited for India-rubber growing, making the sum available about Rs. 600. This would of course be inadequate were it not so arranged that the plantation is worked as a sewage farm. Thus the co-operation of the night-soil trenching staff is secured. Their pay is a charge to be met from the General Cantonment fund. Statement III shows the sanctioned scale for actual trenching work apart from the labour employed in collecting and carting out the night-soil, as well as the staff engaged and paid out of the rubber grant. This will give an adequate idea of the cost of the experiment as a whole.

19. For the better working of the project I have engaged a small gang of Mappillas from Malabar. Those men show a keen interest in their work, and, though I must acknowledge the pains taken by the Burman head mali and the Coringis under him to make the cultivation a success, I prefer the Mappilla to the Coringi, on account of his physical strength and energy if for no other reason. It is too early yet to report definitely on the gang, but they show capacity and I hope will justify their importation.

20. *Future requirements.*—As the plantation extends, more attention, and possibly a larger temporary establishment will be required for watering and shading young trees in the dry weather. A masonry well in a central position will sooner or later become necessary, and for access of the carts to the ground to be manured (especially in the wet season) the main cart-tracks should be covered with laterite. There is abundance of laterite in the adjoining cholera camping ground, but for its extraction the orders of the Government of India in the Military Department are necessary. The General Officer Commanding Rangoon District has been applied to in this matter in the interests of Cantonment conservancy.

21. Another point for consideration is the acquisition of land in extension, should the present experiments be approved by Goverument. Extension to the north and to the east is barred by the cholera camp and the kambe tank, but the soil of the whole "dangerous zone" of the Kokkaing rifle-range to the south (*i.e.*, to the stop-butts of the rifle-range itself) is of the same class as that of the land now occupied.

22. The plantation at present is, for all practical proposes, safe from stray bullets and will be so until the impending change in the weapon used by native troops take place. Although a much-used throughfare crosses the line of fire at 300 or 400 yards beyond the butts, no accident as far as I can ascertain has ever been reported to the District authorities. But with the ·303 rifle in use, as may be the case next year, not only the military cholera camp, but nearly half a mile of metalled high-road (the circular road round the Victoria Lakes) will fall into the "dangerous zone," and accidents may then be looked for.

23. Under these circumstances, there is every probability that the Military authorities will move for the range to be abandoned and the musketry of the whole garrison carried out upon the Thamaing rifle-range, which is suited to weapons of greater carrying power. Should this occur, it might be desirable that the land be created a forests reserve and planted up throughout its length with India-rubber.

Statement of establishments employed upon the Combined Rubber Plantation and Conservancy trenching-ground at Kambe.

Establisment.	No	Paid from Cantonment Fund. Rate per mensem.	Rate per annum.	Paid from Rubber Grant. Rate per mensem.	Rate per annum.
		Rs.	Rs.	Rs.	Rs.
(1) Head gardener (Burman rated on Cantonment establishment as trench cooly).	1	10	120	5	60
(2) Trench maistry (Koringi sweeper caste)	1	15	180	...	...
(3) Garden coolies Mappillas)	4	...	..	11	528
(4) Trench coolies–(Mappillas)	2	11	264	...	..
(5) Trench coolies (Koringi Hindus) ..	2	10	240	...	..
(6) Trench coolies (Koringi sweepers) ...	5	10	600	...	..
Total ...	14	...	1,404	...	588

(1) Duties include supervision of all day work, whether trenching or gardening—two-third pay to Conservancy, one-third to garden.

(2) For night work. Receives night soil carts as they arrive (midnight to 4 A.M.) and sees contents discharged into trenches and buried by the sweepers.

(3) General gardening operations. To help in opening trenches if required, but not in filling them.

(4) To open trenches on clean lands only.

(5) To open trenches, and repair and extend cart-tracks, fence, &c.

(6) To cover in trenches and to mound night soil &c.

HINTS ON PLANTING CITRUS TREES.

By Hon. T. H. Sharp.

The Holes—Dig holes 2 feet wide by 1 foot deep, 20 feet apart each way a week before planting if possible. The earth out of the holes should be placed in two heaps, on either side of the hole. See that the land is well drained.

Planting.—Expose the roots of the plant as little as possible. Examine and cnt away all injured and broken roots. Dip the roots of the trees in a bucket of thick wood ashes and water and leave them there. Draw the surface earth surrounding the hole into it, leaving the two heaps intact. When the hole has been filled add a little from each heap so as to make a large mound—place the plant to stand on top of the mound and lay all the roots out in their natural position, then open the mound, place the tree in the earth, breaking down one side of the mound so that your hand can get under the tree—get hold of the end of the tap root and see that it is not bent—press the earth firmly around it and ram with the hand to settle it. Then carefully raise the roots with the back of your hand, placing them in their natural position, ramming in earth all the time under the roots until you get to the base of the tree. Should some of the roots be longer than the width of the whole be careful not to bend them in, but break the land with a fork and lay the roots out at full length, covering them with fine surface earth about two inches deep. When you have finished planting, the crown roots or part of the tree which originally joined the earth, should be four to six inches above the surrounding land, because the mound will gradually subside, and it is fatal for the tree to sink below the level of the surrounding earth so as to be in a hollow. Nine out of ten citrus plants are planted too low in the first instance. Be sure to press the earth above the roots and around the tree with the naked feet, for unless the tree is firmly set in the earth, the wind will start it shaking, and as it begins to shake a little space will appear between the earth and the tree leading down to the roots, and the air will get in and kill the tree. Be sure to press the earth around the roots and around the tree after planting; it is absolutely necessary. Be very careful to see that fine earth is pressed against every part of every root, or small cavities will be left against the roots and the foul air will start to rot that portion of the root and injure the tree. After planting put one basket of stable manure around the top of the mound, and water. Do not let the manure be within six inches of the stem of the tree. After watering throw some light trash over the mound, then examine the top of the tree, and cnt back to within one inch of the first joints which show good buds. The stem should be within three or four feet above the level of the ground. Do not wrap paper or anything around the tree to shade it from the sun, because it will offer such resistance to the wind as will canse it to shake the tree. Be careful not to cnt back your tree too much; if you cut below the soft wood and succulent bnds it will not live; better to leave too much than too little on the tree.

After Planting.—As soon as the tree starts to grow do not go fooling with it by cutting and prnning and disturbing its system, remember that every leaf it puts out has its corresponding root, and what you want is to create growth with vigour. Placing manure or anything but fresh, fine, sweet earth in the hole before planting is a mistake; the tree cannot feed on coarse manure at its start, and it congests around the new roots, and very often starts acidity at the base of the tree. If no rain falls, water every third day after planting until the tree starts to spring. The citrus family are not great water drinkers, and after starting them they do not require very much more than the rain they get. When practicable plant two Castor Oil seeds about four feet from each hole; they will grow and form a good shade for the trees and keep off insects. Two weeks after planting throw on the balance of the two heaps of earth to cover cracks.—*Journal of the Jamaica Agricultural Sociey.*

Eltham Park, Jamica.

RAISING TURKEYS.

1. Never let the young turkeys get wet. The slightest dampness is fatal.
2. Feed nothing the first twenty-four hours after they are hatched.
3. Before putting them in the coop, see that it is perfectly clean and free from lice, and dnst them three times a week with insect powder.
4. Be sure the hen is free from lice. Dust her, too.
5. Look out for mites and the large lice on the heads, necks, and vents. Grease heads, necks, and vents with lard, but avoid kerosene.
6. Nine-tenths of the young tnrkeys die from lice. Remember that.
7. Filth will soon make short work of them. Feed on clean surfaces. Give water in a manner so that they can only wet their beeks.
8. The first week feed a mixture of one egg (beaten) and sifted ground oats, mixed with salt, to taste and cooked as bread; then crumble for them, with milk or curds, so that they can drink all they want. Feed every two hours early and late.
9. Give a little raw meat every day; also, finely chopped onions or other tender green food.
10. After the first week, keep wheat and ground bone in boxes before them all the time, but feed three times a day, on a mixture of cornmeal, wheat middlings, ground oats, all cooked, and to which chopped green food is added.
11. Mashed potatoes, cooked turnips, cold rice and such, will always be in order.
12. Too many hard boiled eggs will cause bowel disease.
13. Remove coop to fresh ground often in order to avoid filth.
14. Ground bone, fine gravel, gronnd shells, and a dnst bath mnst be provided.
15. Finely-cnt fresh bones, from the bntcher's, with the adhering meat, is excellent.
16. They mnst be carefully attended to until well feathered.
17. Give them liberty on dry, warm days.
18. A high roost, in an open shed, which faces the south (north here), is better than a closed house for grown turkeys.
19. A single union of a male and female fertilizes all the eggs the hen will lay for the season; hence, one gobbler will suffice for twenty or more hens.
20. Two-year-old gobblers with pullets, or a yearling gobbler with two-year-old hens is good mating. Gobblers and hens of the same age may be mated, but it is better to have a difference in the age.
21. Turkeys can be hatched in an incnbator and raised to the age of three months in a brooder, but ouly in lots of twenty-five, as they reqnire constant care.
22. Capons make excellent nurses for turkeys and chicks.
23. It is not advisable to mate a 40-ponnd gobbler with common hens, as the result will be injury. A medium sized gobbler is better.
24. Young gobblers may be distinguished from the females by being heavier, more masculine in appearance, more caruncnlated on the head, and by a development of the "tassels" on the breast. A little experience may be required at first.
25. Adult turkeys cannot be kept in confinement, as they will pine away. By feeding them in the barnyard a little, night and morning, they will not stray off very far, but they cannot be entirely prevented from roaming, and the hen prefers to make her own nest.—*Poultry Keeper.*

CINNAMON IN LONDON.

The news brought by a recent mail touching the last quarterly sale of cinnamon reads better than the telegram we published three weeks' back. The prices realized for the finer qualities of spice are decidedly encouraging—being almost on a level with the highest prices recorded in recent years; while those obtained for lower marks and "unworked" were by no means bad. The result was probably due, in great measure, to the moderate offerings, only 834 bales having been catalogued last month, against 1,141 at the corresponding sale last year, and 1,088 bales in May last. Our export tables for the last seven or eight months showed that there had been a wholesome check to the steady increase in production, whose effect on prices is naturally depressing; and the consequence was a catalogue of reasonable proportions. The demand for fine cinnamon, which can bear the cost of the operations of unbaling, examining and rebaling, known to the trade as "worked," was such as to have ensured the clearing of the whole of the 395 bales which offered, at prices which were in some cases as much as a penny in advance of those realized at the second quarterly auction for the year—Firsts realising as high as 1s 7d, Seconds 1s 5d, Thirds 1s 4d and Fourths 11d. Of "unworked," 300 bales changed hands at prices ranging from 8½d to 11½d—leaving less than one-half that quantity unsold by auction; but such leavings are generally taken off almost immediately at sales' rates underhand. Any way, the statistical position of the spice is good, as will been seen from the figures appended to the Report we give below—both quilled bark and chips showing appreciably lower stocks than at this time last year. Only of so-called "wild Cinnamon" is the quantity greater; while the fact that the enormous quantity of wild chips, 8,037 bags, which was shown in last year's stocks, remained unaltered this year, confirms the report that this recent and discreditable addition to our exports is quite neglected. The discovery by importers and exporters that the prices offered are insufficient to cover even the Dock charges incurred, is likely to give the quietus to a trade which should never have begun, and which, we are glad to think, has not benefited those who doubled in it.

While the restricted output of the first seven months of the year has undoubtedly helped prices, it must be noted that there has been quite a rush of shipments the last few weeks; and the exports to date for the last four years compare as follows:—

Total Export from 1st Jan. to 16th Sept.	Bales. lb.	Chips. lb.
1901	1,627,200	915,156
1900	1,602,639	1,040,414
1899	1,509,545	1,403,288
1898	1,722,301	794,539

The following is Messrs. Forbes, Forbes & Co.'s Report on last sales in London;—

London, 27th August, 1901.

CINNAMON.—The third series of auctions for the year were held yesterday, when 834 bales Plantation kinds were offered against 1,088 bales in May, and 1,141 bales at this period last year. Of this supply 395 bales were "worked" and 439 bales "unworked."

There was a very fair demand and the whole of a 395 bales "worked" spice changed hands at last sales prices to occasionally one penny per lb. advance. For the "unworked" the demand was not so good, barely 300 bales being cleared, good sorts going at firm prices, but common sorts a shade cheaper here and there.

"Worked" Firsts ranged from 11d to 1s 7d; Seconds 9d to 1s 5d; Thirds 8½d to 1s 4d; Fourths 8½d to 11d per lb. "Unworked" Firsts 9½d to 11½d; Seconds 8d to 11d; Thirds 8½d to 11d; Fourths 8½d to 9d per lb. Of so called "'Wild" Cinnamon 687 bales and bags were offered, but were quite neglected, a few bags only meeting a bid of a half-penny per lb. not sufficient to cover the Dock charges incurred.

Chips, &c.—664 bags offered, about 160 bags less sold; chips 2½d to 3½d. Quillings 7d to 8½d per lb. The ss. "Prometheus" with some Cinnamon on board arrived in the River on 24th inst. too late for the sales.

			1900.
Stocks of Ceylon		1,736 bales	2,544 bales.
Do	do chips	3,236 bags	5,205 bags.
Do	Wild	2,633 bales	2,581 bales.
Do	do bark, &c.	8,037 bags	8,037 bags.

The next auctions will be held 25th November.

THE BURLIAR GARDENS.

I observe that you would like to know the situation, elevation, etc., of Burliar. Burliar is situated on the Coonoor Ghat, within a few miles of the S. E. base of the Nilgiris, at an elevation of about 2,400-2,500 feet. The garden is only about seven acres in extent, and a considerable variety of tropical and sub tropical plants are cultivated in it. —R. E. P.

TESTING PRECIOUS STONES.

The United States Consul-General at Frankfort in his last report, calls attention to a lecture on precious stones, recently delivered before the Industrial Association of Berlin, by Dr. Immanual Friedlænder, in which it was stated that the testing of diamonds is comparatively simple. The common test for hardness suffices. If the stone resists strong attacks, it is certain to be genuine; if it does not, the damage is insignificant as only an imitation has been destroyed. The test, however, is doubtful with rubies. If a ruby can be affected by a steel file or by quartz, it is not genuine, but such a test with a topaz is likely to injure a valuable stone. The test for hardness is of no avail with emeralds, as these stones are not much harder than quartz, and in addition possess the quality of cracking easily. For examining rubies and emeralds the optical test is best. A glass magnifying about one hundred times suffices. Every expert knows that almost all precious stones have, according to Dr. Friedlænder, little flaws. Nearly every ruby, and all emeralds have many defects, which are so characteristic that the genuineness of the stone is readily established. Such a test is necessary with rubies, because the imitations are very deceiving. Their colour is absolutely durable, and often much finer than that of the genuine stone, although it may be stated that a somewhat yellowish tint is always suspicious. The only reliable way in which genuine rubies can be distingushed from imitations, is by the minute air bubbles of the latter, which become clearly visible under the magnifying glass. These are not to be found in the natural gem; on the other hand, the

imitations lack certain defects, characteristic of genuine rubies—certain vacuums, whose outlines are much more indistinct that those of the air bubbles in imitations. Fine emeralds have similar characteristic defects, such as enclosures of liquids and curious dentrites. Sapphires also show peculiar netlike formations.—*Journa of the Society of Arts*, for August 23.

CHESNUT CULTIVATION IN FRANCE.

The work of growing chestnuts and preparing them for the market is extensively carried on in France, and Lyons is the centre of this industry. Many varieties of chestnuts are grown in a number of Departments, and are called 'Marrons' and 'Chataignes.' The latter is the smaller and the less desirable of the two. The marron is cultivated only by grafting, while the chataigne grows wild. Among the different varieties are the following :—'Chataignes des Bois' (wild chestnuts), small but of little savour ; 'Chataignes Ordinaires, a little larger and taller than the former; the 'Yellow Spring,' early and very productive ; 'Exalade,' the best of all ; the 'Pealoue,' a large, good eating fruit. The best marrons are those known as 'Marrons de Lyon,' of which the fruit is large and almost round, the shell is thin and the epiderm light; the 'Dauphinoise,' the 'Great Red,' the 'Great Green,' the 'Partalonne,' the 'Pelagrine,' the 'Marron d'Aubray,' the 'Marron d'Agen,' and the 'Marron du Luc. In the Department of the Correze the favourite marrons are the 'Early Black,' the 'Early Red,' the 'Early May,' the 'Humineaux,' the 'Humineaux Rouge,' the Matronne' and the 'Correze.' In some parts of France in what are called the schist lands, chestnuts from a very important article of daily food. They are boiled, pulverised, and eaten like mashed potatoes. In every city, and nearly every village, during the autumn and winter, they are sold in doorways and at street corners fresh from large roasting pans. The chestnut occupies a conspicuous place in confectionery. Every confectioner buys them and prepares them. There are large establishments all over France where chestnuts are prepared. According to the United States Consul at Lyons, the principal one in that city employs from 200 to 250 hands, chiefly girls and women. In this establishment over 25,000,000 lb. of chestnuts are dealt with annually. In the preparation, the nuts are first peeled and then boiled in clear water, when the second skin is removed. They are then placed in a syrup highly perfumed with Mexican vanilla. It is said that this vanilla retains the perfume better than other kinds. The fruit is left three days in the syrup, and then set to drain. Afterwards it is treated to a thin coating of vanilla packed in boxes and shipped. The work of preparing chestnuts for the market goes on night and day for three or four months of the year, while the fruit is in condition. During the rest of the year the establishment is engaged in preserving other fruits. Chestnuts are grown in Limousin, Perigord, Cevennes, Alpes, Isère, Pyrénées Ardeche, Var, Auvergne, Sarthe, and in Corsica. The wood of the chestnut tree is considered valuable for many purposes. It is strong and tenacious, and may be subjected for years to the influence of air, wind or water without decaying. In some places the trees are cultivated solely for the wood. It burns well and produces a great heat, but is considered dangerous as fuel on account of its tendency to throw out sparks. It makes excellent charcoal. The wood finds many uses in France, the smaller branches for hoops, bread tally sticks (short pieces containing a number of notches which mark the number of loaves of bread sold to a customer), lattice work, small baskets, supports for vines, ladders, &c. The tree flowers in May and June, and requires no special care in its cultivation on account of its hardy character. It flourishes in gravelly soil or shale. A calcareous soil is fatal to its growth. In many parts of France the trees have been planted on hill sides, and it is said that losses from inundations have greatly decreased in the Cevennes since these trees have been planted on the mountain slopes there.—*Journal of the Society of Arts*, August 30.

COPRA AND COCONUT OIL IN THE STRAITS SETTLEMENTS.

On account of numerous inquiries from the United States in regard to copra, coconut oil, poonac and also an allied substance, vegetable tallow, Consul O F Williams submits the following report :

Copra.—During the calendar year 1900 there was imported into the Straits Settlements 93,074,933 1-3 pounds of copra, the import value of which was $4,455,489 Mexican. Of this, Bali Island sent about 24 per cent.: Natunas 17 per cent. ; Dutch Borneo, 16 per cent. ; Celebes, 11 per cent.; the Netherlands Archipelago, 7 per cent. ; Sulu, 7 per cent., and Johore 6 per cent.

During the same year there was exported 91,160,026 2-3 pounds of copra, valued at $4,416,937 Mexican ($2,102,462). The following countries received the greater part: Russia 39 per cent ; France, 32 per cent.; Italy, 10 per cent. ; Spain, 5 per cent. ; Germany, 4 per cent. ; Austria, 3 per cent. ; and Belgium, 2 per cent. About one-fourth of 1 per cent. went to the United States.

Coconut Oil.—Of coconut oil there was imported during 1900 10,105,733 1-3 pounds, the import value of which was $1,011,679 Mexican $381,599). About 97 per cent of the oil came from Ceylon. During 1900 coconut oil was exported to the amount of 14,740,533 1-3 pounds, the export value of which was $1,500,910 Mexican ($714,433).—*Oil Paint and Drug Reporter*, Aug. 19.

INDIAN TEAS FOR ODESSA :

COLOMBO AND SINGAPORE AS PORTS FOR TRANSHIPMENT.

Our special telegram from Calcutta shows us that the Indian Tea Association are keenly on the alert as to the merits of Colombo and Singapore respectively as ports of transhipment. Misled by information which we believe appeared in the local "Times", Messrs. Aitken, Spence & Co., quoted freight from Calcutta to Singapore at R25 per ton, whereas it should be only half that amount or the same as to Colombo. The comparison therefore runs :—

Via Colombo.		
Freight from Calcutta	..	R12·50
Transhipment charges	...	R 4 00
Freight to Odessa at 30s say		R22·50
Total	..	R39·00
Via Singapore.		
Freight from Calcutta	..	R12·50
Transhipment charges	...	R 1·50
Freight to Odessa	...	R22·50
Total	...	R36 50

Doubt may well be felt as to whether transhipment charges at Singapore can really be *less than half* those prevailing here or R1½ against R4 for Colombo? Then, there are chances, we understand, of freight being got

at Colombo for Odessa at 25s in place of the 30s quoted, which would make a considerable difference. Messrs. Aitken, Spence & Co. deserve thanks for taking up this matter in the public-sprited way they have, and we trust in further correspondence, they will be able to show that the economic, as well as every other advantage rests with Colombo. Apart from gain in time. there must surely be many more opportunities for freight between Calcutta and Colombo than between Calcutta and Singapore. The latter part of our telegram refers to liners which are willing to book tea from Calcutta to Odessa, for 47s 9d—that is 28s 9d, to Port Said and 19s thence to Russian ports, the latter freight being guaranteed in vessels flying the Russian flag. But Colombo steamer Agents should do better than this.

THE "PODHI-TREE."

["The Committee will be greatly helped in their work of gaining knowledge of cocoa in relation to profitable cultivation if you will make experiments and carefully record notes of their results."—Extract from *memo of suggestions* (to planters) issued by the Sub Committee, March 1901.

"Mr. Carruthers has denied having seen the final draft of the *memo* before it was attempted to circulate it, which narrows the Sub-Committee down to Mr. Huxley, *ipsissimus solus.*"—"Pod" in the "Times of Ceylon," September 13th.]

The cultivator then ringed the branch with nine cuts over the original cut at intervals of three inches. From the original cut the principal and from the other cuts the minor roots, ten from each, shooting forth like a network, descended (into the famous casket). The Theras [of the P.A.] on witnessing this miracle (with uplifted hands) set up a shout which was echoed by the surrounding spectators. A delighted deva expressed his joy by shouts of 'Sadhu' and the crowds of cultivators, waving thousands of shade-trees over their heads, cheered.

Thus this (branch of the) great 'Podhi-tree' established itself in the begrudged casket with a hundred roots, filling with delight the whole attendant plantinghood. The stem thereof was ten cubits high; there were five branches, each four cubits long, adorned with five pods each [at the rate of 2½ cwt. per acre]. From the five main lateral branches (others) amounting to a thousand were formed. Thus was this great 'Podhi-tree' endowed with a fullness of beauty that entranced the mind of Peradeniya, the cultivator.

From the pods of the great Podhi branch, brilliant rays of the six primitive colours issuing forth, illuminated the whole island.

On the fifteenth, being the full moon day of the bright half the month Assayuja the deva took possession of the great podhi branch. At the end of two weeks from that date, being the fourteenth day of the dark half of the month Assayuja, canker appeared. On the first day of the bright half of the month Kattika, having compounded some *bordo mittchcha*, he made many cuts applying the *mittchcha*. On the seventeenth day after the deva had received charge of it, its new leaves a turned yellow. From that circumstance the deva, no longer overjoyed, dedicated a third of Kalpa to the great podhi-branch. Thus this excellent and pleasing experiment on the great podhi-branch, radiant with the mingling of divers colours, became the means of its attaining 'Nirvana.'

The gifted Theras, for the purpose of ascertaining the capacity of the cultivators, interrogated him:—

'O Peradeniya! what is this tree called?'
'It was called a podhi-tree.'
'Besides this one, are there any other podhi-trees.'
'There are many *cankered* podhi-trees.'
'Besides this podhi-tree, and those other cankered podhi-trees, are there any other trees on the earth?'
'Lords! there are many trees, but they are not cankered.'
'Besides the other cankered podhi-trees, and the trees that are not cankered, is there any other?'
'There is this tree.'—Worse luck!

Then, still for the purpose of ascertaining capacity, the gifted Theras interrogated the deva:—
'*Ipsissimus solus*! have you any questions to ask?'
'O Lord!—I have many.'
'*Ipsissimus solus*! are there any questions you have not asked?'
'There are many, but they are not my questions.'
'Besides the questions you have not asked, and those that are not thy questions, are there or are there not any others in existence?'
'Well! there are always *my* questions.'
'*Sadhu*!' 'shouted with one accord the Theras, thou art wise!'

A chapter in the 'Podhivansa,' entitled 'The introduction of canker,' calculated little to delight but to afflict poor planters.

THE INDIAN BOUNTY ON GREEN TEAS.

The Indian Tea Association (Calcutta) has issued the following circular, dated 9th Sept., 1901:—

At the meeting of the General Committee held on the 30th July last, a sub-Committee was appointed to consider and to report upon the feasibility of inducing growers to manufacture green teas of like qualities, and of making arrangements for bulking them in Calcutta.

2. I am now directed to subjoin for your information a copy of a memo., dated 26th August, containing the outlines of a scheme which the sub-Committee have suggested. For the reasons stated in the concluding paragraph of the memo., the scheme cannot be put into practice until next season. And before definitely accepting it, the General Committee desire to ascertain the views regarding it of those members of the Association who are interested in the manufacture of green teas. The scheme is based upon the assumption that the money required will be forthcoming, but this will depend upon the measure of support given to the new levy for the Foreign Market Fund. I am however instructed to suggest that members should now submit samples of the green teas which they will be able to manufacture next season; and should also state the quantity which they will be prepared to offer, and the time when it will be delivered in Calcutta. As will be understood from clause 7 of the memo., it is proposed that the bounty should be paid at the present rate, *i.e.*, 1½ anna per lb.

3. The whole question is one of great importance, and the General Committee are most anxious that any scheme which may be ultimately adopted should first be thoroughly approved of by the industry. They trust therefore that if you have any criticisms to offer upon the memo., you will kindly submit them without delay.

"PARA RUBBER IN BURMA";

A MEMORIAL FROM THE CEYLON PLANTERS' ASSOCIATION.

The Memorial of the Planters' Association to Mr. Chamberlain, on the above subject, will be found given *verbatim* below. At first sight, the protest it embodies may seem narrow-minded and altogether unworthy of the planters' representative institution in the first of Crown Colonies. But a little further consideration and reflection will, we think, show the movement to be both justifiable and well-timed, in order that a clear understanding may be arrived at as to the purpose to be held in view by the Indian Government in forming experimental plantations for rubber-growing in Burma. One enthusiastic writer, some time ago, went so far as to anticipate a large increase to the revenue from the extension of rubber plantations by Government in suitable localities in Burma. The Memorial speaks of 5,000 acres; but we think one estimate was that the Government might extend their planting to 10,000! Now, this undoubtedly would be an interference with private enterprise; because the produce would have to be sent to Europe or America to find a market. The case of Cinchona is very different; for, all the produce of the Government plantations of this bark is required for local consumption in the laboratories at work for the benefit of poor fever-stricken people in India. No such philanthropic object can be pleaded in the case of "rubber." True the authorities are fully justified in leading the way in exploiting a new product either in their Botanic Gardens or in an experimental plantation. To such a mission in the case of Burma, where private capitalists interested in planting are few and far between, there can be no valid objection, and the Government of India is to be congratulated on having in the spot one so well-qualified to take an interest in rubber experiments as is Major J. A. Wyllie of the Indian Staff Corps who recently addressed us on the subject of certain rubber varieties. It is when successful results have been attained and when the industry has been established on a profitable basis, that the Indian Government must stand on one side, refrain from shipping the product and be prepared to sell their plantation to the highest bidder and look for their reward through an influx of capitalists and practical planters ready to purchase or rent Crown land suitable for rubber plantations and to go ahead as cultivators. This, we feel sure, is all that the Planters' Association requires. Their Memorial is not intended to stop an interesting official experiment in rubber planting; but to make it clear from the outset that the Government of India is not to compete as producers in the home market; and we have no doubt that the required assurance will be forthcoming.

Incidentally, the Memorial before us affords Mr. Chamberlain and all its readers, a good deal of interesting information respecting the rubber-growing enterprise, more particularly as it stands at the present time in Ceylon and the Straits Settlements; and enough of progress is reported to show that for the Indian Government to plant up 5,000 acres with the view of becoming rubber growers for the markets of the West, would be a serious and unjustifiable interference with private planters in the adjacent Colonies if not later on in Burma itself. To an experimental plantation of a few hundred acres, no such objection could be raisd, provided it were understood that Government would be prepared to dispose of their successful venture to private capitalists whenever such came forward with a price adequate to the outlay incurred.

The following is the text of the Memorial sent by the Planters' Association of Ceylon to the Secretary of State of the Colonies on the subject of experimental cultivation of Para Rubber in Burma which we were obliged to hold over Monday :—

To the Right Hon. JOSEPH CHAMBERLAIN, M.P.,

His Majesty's Secretary of State for the Colonies, Downing Street, London.

The Humble Memorial of the Planters' Association of Ceylon, and others.

Respectfully Sheweth :—

1. That your Memorialists, having received information that the Government of India is taking steps to develop the cultivation on a large scale of Rubber-producing trees in Burmah notably the Para Rubber tree—Hevea brasiliensis, Mull. Arg—in the Tenasserim division of Burmah, desire to bring the question under your consideration.

2 Since 1880, when the late Director of the Royal Botanic Gardens, Peradeniya, drew up notes on some trees yielding India Rubber, considerable interest has been taken in the cultivation of Rubber both in Ceylon and in the Straits Settlements, and your Memorialists now approach you in the hope that His Majesty's Government may make such representation as will prevail upon the Government of India not to enter into the field as competitors with private enterprise in the Markets of the World.

3. In a report of the Planters' Association of Ceylon a few years ago the following sentences appear :—"The increasing demand for Rubber both in Europe and the United States has again of late drawn the attention of the Planting Community to this product, and the area being planted with the Para variety is rapidly increasing. Several of the lower district estates have a fair acreage under this cultivation." Since the above was written the planting of Para and other varieties of Rubber yielding trees has been considerably extended and from the returns furnished for "Ferguson's Handbook and Directory" it has been estimated that there are now over 2,500 acres planted with trees of all ages and varieties in Ceylon alone.

These trees have in most cases been planted on tea and cacao estates as a subsidiary cultivation with a view to mitigate the losses sustained by planters through the serious decline in the price of Tea.

The following is from a report of Mr. Willis, Director of the Royal Botanic Gardens, Peradeniya, dated 1898 :—"From what I saw of the condition of the trees and the results of the tappings, I am strongly confirmed in my previous opinion that the cultivation of rubber bids fair to form a profitable industry in Ceylon and a useful adjunct to the larger industry of tea and coconut cultivation." In his report for 1899 Mr. Willis points out that six or more years must elapse before any returns are forthcoming and warns planters that in a few years substitutes for Rubber may be largely used and cause a drop in the price.

The above is quoted as showing that the results of private enterprise in the planting of Rubber would not be apparent for some years, meanwhile it is known that considerable quantities of seed have been exported to the Straits and elsewhere so that it can hardly be necessary to commence an extensive experimental plantation in a similar climate and under similar conditions,

4. In a recent Report of the United Planters' Association, Malay States, the following sentences occur:—"Rubber (Hevea brasiliensis of Para). This variety of rubber continues to come on exceedingly satisfactorily, the average growth of trees from nine months upwards amounting to about 1 foot per mensem, whilst at three years their average circumference at 3 feet from the ground is about 16 inches. This far exceeds anything reported from Ceylon and other countries where Para is being planted, and we consider that Mr. Curtis' description in the 1900 annual Report on the Botanical Gardens of the Colony, of the tapping of the 15 year-old Para tree in the Gardens at Penang, is conclusive evidence of the contention of the writer 'that in this cultivation lies a source of wealth of the greatest importance.' In two years 12½ lb of dry marketable Rubber were procured 'without any apparent injurious result to the health of this tree', and the conditions under which it is growing are reported as anything but favourable. It appears in the opinion of the different Directors of the Botanical Gardens, that the size of a tree more than its age indicates its fitness for tapping, and probably a circumference of 30 inches 3 feet from the ground is the limit at which attempts to extract the Rubber should be commenced. Reports from London show that prices of Para have of late declined, one reason alleged being the falling off in the demand for bicycles; but in Para Rubber we have undoubtedly the most valuable and highest quality rubber in the world, and your Committee feel that the large number of trees amounting now to several millions, planted in the Federated Malay States, must, in the not very distant future, prove a source of revenue which will largely recoup the planters for the losses which they have sustained through the decline in value of Liberian coffee."

5. From the above quotations it seems plain that the success of the planting of Para Rubber in a suitable climate is apparently assured and that, therefore, no extensive experimental plantation of 5,000 acres is necessary, and your Memorialists submit that Government rivalry with private enterprise in the production of Rubber is to be deprecated. The industry is already threatened with the production of cheap substitutes, and prices are declining and it is felt that the production by the Government of India of such a large amount as is likely to be secured from the plantations in contemplation would be a serious and undue competition with private growers who have, as it is, to contend with the enormous productions of the indigenous trees in the forests of South America and East and West Africa.

6. An authoritative statement that the Government of India had no intention of placing Rubber on the London market nor competing with private enterprise by large operations, would, of course, tend to remove any cause for alarm. In 1882 representations were made to your predecessor Earl Kimberley on the subject of Government sales of Cinchona bark, and at that time Government was asked to obtain all possible information regarding the Indian Plantations, and the intention of Government as to the future disposal of the product of the Cinchona tree. Government then gave a distinct assurance that it was not intended in any way to interfere with the ordinary course of trade or to do anything prejudicial to private interests. The two cases seem to be sufficiently analogous to call for similar treatment, and your Memorialists venture to express a hope that His Majesty's Government will respond to the representations submitted.

7. Wherefore your Memorialists pray that the present position of British-grown Rubber Producers may be considered by His Majesty's Government, and that any necessary action may be taken in the matter. And your Memorialists as in duty bound will ever pray. On behalf of the Memorialists.

(Sgd.) A. Philip, Secretary. (Sgd.) Edward Rosling, Chairman.

Kandy, Ceylon, 3rd Sept.

THE KING ACCEPTS A BOOK ON "COCOA" PLANTING.

BY OUR CORRESPONDENT, MR. H. H. SMITH.

The King has graciously accepted a copy of Mr. Harold Hamel-Smith's book entitled "Some Notes on Cocoa Planting in the West Indies."—*Daily Express*, Aug. 31.

INCREASE OF OVER £1,060,000 IN THE BRITISH TEA DUTY REVENUE.

(*Extract from the Report of the Commissioners of Customs.*)

The annual report of the Commissioners of his Majesty's Customs for the year ended March 31, 1901, which was issued as a Blue-book on Saturday, is rather more interesting than usual. The gross Imperial Customs Revenue collected in 1900 1901 amounted to £26,614,609, or, after deduction of drawbacks and repayments, to £26,270,959. This is £3,227,487 more than the produce of 1899-1900 and £2,650,959 more than the Budget estimate for the year.

The amount received from the tea duty was £6,264,515, an increase of £1,635,569 over the previous year. The Commissioners say:—

The progress of the increased consumption of tea in the past three financial years has been obscured by the quantity held over from one year and by the forestalments of the other two years. A truer comparison is afforded by the quantities retained for consumption in the past five calendar years, viz:—

	lbs.		lbs.
1896 ...	227,722,000	1899 ...	242 506,000
1897 ..	231,328000	1900 ..	249,751,000
1898 ..	235,353000		

The forestalments by the tea trade occurred in tho last quarter of the financial year; and so disturbed the normal out-turn of the year; but by comparing calendar years these irregularities are corrected by adjustments of the trade during the rest of the year. In each of the past two years there have been increased quantities taken for consumption of about seven million pounds or 3 per cent. over the preceding years. In the last calendar year the increase of duty from 4d. to 6d. per pound commenced on March 6, so that there was ample time in the succeeding year for the effect to be observed. The result showed a continued increase of consumption. But while this testifies to the well-being of the population, another cause, that of low prices, has also contributed to bring about this satisfactory result.—*London Times*. Sept. 2nd.

Pearls Impervious to Röntgen Rays.—An experiment conducted by Professors David and Pollock at the instance of Messrs. Fairfax and Roberts, demonstrated that pearls are impervious to the Röntgen rays, though somewhat transparent under powerful electric vibrations. Thousands of pounds worth of pearls are lost annually through paring to discover a better skin or lustre, and it was desired to ascertain the internal layers of a very large pearl.—*Sydney Mail*, Aug. 10.

EXPERIMENTS WITH WHITE ANTS.

BY A PHILIPPINES FOREST OFFICER.

Capt. McCabe, in charge of the Forestry Bureau in the Philippines, has commenced a series of experiments to test the extent of damage done to wood by white ants or termites, and to learn remedies or checks for these tropical scourges. He is obtaining specimens of the wood boring ants and testing their damage to the various classes of woods grown and used here, and the tests extend also to American woods in use. To this end he is inviting all those interested to send him specimens of ants wherever they are found committing their injuries, and most probably his experiments will result in a highly interesting report.—*O. China Mail*, Sept. 9.

MAJOR ROSS'S ANTI-MALARIA MISSION.

AN INTERESTING ACCOUNT FROM LAGOS.

The Liverpool School of Tropical Medicine received on Saturday the following account of the progress of Major Ross's mission at Lagos :—

The praiseworthy activity of the Lagos Government in health matters has heen prominently brought to public notice during the visit of Major Ronald Ross, F R S. of the Liverpool Tropical Medicine to the colony. Major Ross, having inaugurated his campaign against mosquitoes in Sierra Leone, arrived on a brief visit to see what was being done here in the same line, and received a very warm welcome. He was entertained at dinner by his Excellency the Governor, Sir William MacGreg r, and by Mr. C Tambaci, president of the Chamber of Commerce, most of the leading people of Lagos being present on both occasions. He was also conducted by his Excellency in his yacht to Badagry, and by Dr. Henry Strachan, the chief medical officer, to the great native city of Ibadan, by the new railway, 120 miles from Lagos.

On August 2nd at a lunch given by the Governor for the purpose of introducing Major Ross to

THE LAGOS LADIES' LEAGUE,

speeches were made which indicated the nature of the important sanitary efforts now being attempted in Lagos to control malaria—efforts which will probably soon be followed in many other parts of the tropical world. His Excellency remarked that there was something very appropriate in bringing together Major Ross and the ladies of the league, for it was quite likely that, had there heen no Major Ross, there would have boen no league. He felt it a great honour to have Major Ross at his table and in the colony; he took a pardonable pride in presenting to him a society of ladies who had voluntarily come forward to work in the cause of humanity, and he believed that no other governor on the continent of Africa could produce before Major Ross a similar band of workers. Sir William Macgregor continued :—

"You have seen, Sir, that Lagos is not the charnel-house it has often been represented. You have observed something of the country between this and Ibadan, and will have noticed that the land is fertile and lends itself readily to agriculture. Indeed, Sir, in the 30,(00 square miles which form this territory there are probahly not 400 or 500 square miles unfit for cultivation. We are proud of our country and of our people. We feel that this race has taken the foremost place in West Africa. The Yorubas have shown that they are capable of attaining to a high degree of civilization. We hold unanimously a clear and concise policy. We believe that Lagos, already the first town in West Africa, will become a great city. We are of opinion that our energies must be devoted to three great undertakings in order to work out the future of the country—

RAILWAYS, ECONOMIC DEVELOPMENT, AND SANITATION.

You have seen that we have 122 miles of railway now working to Ihadan—a city of 150,000 souls. That railway must he extended towards the interior. We are alive to the fact that in the extensive province of Northern Nigeria there lies a great, a magnificent *Hinterland*, of which Lagos is the natural inlet and outlet. There are no other European possessions in West Africa which can claim to have hehind them a population of 20 millions. We see clearly that military and commercial invasion of this great country can best be prevented by the extension of the Lagos railway to Northern Nigeria. Accordingly, Sir, we shall never rest content until our railway arrives not only at the Niger but at Kano. The economic development of the country we are fostering by setting apart forest reserves; by making numerous roads; by opening model-farms; by establishing a proper botanic garden for the distrihution of economic plants; and we are educating a similar number of the young men of the country in industrial pursuits. You see, Sir, what immense value we attach to our railway and our industrial life. But now I must add our conviction that these undertakings must be carried on hand in hand with sanitation. The first condition of Lagos is improved sanitation, without which these undertakings will not raise the country to the place it should occupy. It is in connection with this point that I bring you and this ladies' league together.

"The primary object in forming this league was as follows :—We have an appalling infantile mortality in this town. We lose 42 per cent of all our children before they reach one year of age. In 1899 we lost 864; in 1900, 842. The principal causes of death are fever and bowel complaints. Fever is our great enemy. It was

TO COMBAT FEVER BY THE ADMINISTRATION OF QUININE

that the ladies' league was created. We are building additional dispensaries; we are earnestly trying to improve the water supply, we are reclaiming swamps, we are delivering courses of public lectures on sanitation and a medical officer has been appointed for the sole purpose of attending the sick poor. But it was felt with all this that there would remain a residuum of the population which we should not be able to reach—and it was to reach it that the ladies' league was formed. The league today numbers 95 members, who are the most refined and highly-educated ladies in the community—all animated by the right spirit to assist the less enlightened people of their country, to preach the use of quinine, the prevention of fever by scientific methods, and the cleanliness of private houses; and that they will succeed in doing very much good I have no doubt whatever."

In introducing Major Ross, his Excellency dwelt, on the importance of his work in connection with malaria. Great Britain, Germany, and Italy had taken up the work. Liverpool stood pre-eminent in this, perhaps hecause it possessed Major Ross and Mr. A L Jones. The Romans were acquainted with the connection between fever and marshes, and even suspected mosquitoes. The same notion had arisen even in the wilds of Africa. Unfortunately, for 20 centuries philosophers and men of science had surrounded and obscured the subject with unfertile hypotheses. The disease had been attrihuted to water, to earth, to bad air without proof. The speaker continued by describing the progress of research, and particularly the investigations of Major Ross, who first determined with experimental exactness the mode of infection in malarial fever, and concluded by referring to the vast importance and far-reaching influence of his work, in the light of which steps were now being taken to deal with malaria.

MAJOR ROSS ON THE PROGRESS MADE.

Major Ross, in thanking his Excellency for his speech, said that he had been on the point of believing that his countrymen were becoming an unscientific and unpractical people. More than two years ago the fact that malarial infection is communicated by mosquitoes had been established by the most stringent scientific and experimental proof; and yet to his knowledge practically nothing had been done by his countrymen to act on this new information, in spite of its economic importance. He had therefore accepted with alacrity the offer of a large sum of money and other facilities from a generous philanthropist and from Mr. A L Jones, Mr. John Holt, and others in England to pay the expenses of practical work against malaria in Sierra Leone. This work had been commenced with every promise of success by his friend, Dr. Logan Taylor, and he had therefore felt himself free to proceed to Lagos to watch the work being done there. He was delighted to find that his pessimistic attitude was not justifiable as regards Lagos. He strongly eulogized everything that was being done against malaria by Sir William MacGregor, himself a distinguished member of the medical profession, by his most able friend, Dr. Henry Strachan, and by the enlightened medical profession and the Ladies' League in Lagos. He had witnessed the rapid and successful filling up of marshes by sand from the lagoons, and the rational utilization of gaol prisoners for this useful work. He had inspected numerous houses rendered mosquito-proof by fine wire-netting, which, while it did not exclude the breeze, as he expected it would, did exclude insects and damp, much to the comfort of the inmates. He highly commended the efforts of the Government to induce their officials and others to take quinine—a prophylactic which was much neglected in consequence of ignorance and faddism. He expressed himself as much delighted with the popular sanitary lectures of Drs. Strachan, Best and Rice—a most useful and striking innovation in Africa, or indeed anywhere. Above all he was delighted with the admirable measures—prompted by the highest scientific knowledge—taken

TO PRESERVE THE IMPORTANT LINE OF RAILWAY FROM THE DEADLY FEVER OF THE FOREST TRACT

through which it passed; and with the Ladies' League, to which he offered, through the president Mrs Sapara Williams, an annual prize on behalf of the Liverpool School of Tropical Medicine. The speaker said that he had come prepared to teach, but had remained to learn; and concluded by exhorting all present to support Sir William MacGregor in the splendid work which he was undertaking not only for the benefit of Lagos, but as an example to the rest of the Empire.

The proceedings terminated with speeches by Bishop Tugwell and Bishop Oluwole.

Before the departure of Major Ross for Accra, Mr C Tambaci and other leading merchants promised to place an annual subscription of £150 in the hands of the Governor to pay for a "Mosquito Brigade" for Lagos.—London *Times*, Sept. 2.

MAJOR ROSS'S RETURN FROM WEST AFRICA.

Major Ronald Ross, Royal Army Medical Corps, landed yesterday at Plymouth on his return from West Africa and proceeded to Liverpool by train. Before leaving Plymouth he gave a Press representative an account of the work which is being done in Freetown and Lagos under his direction as leader of the expedition sent out by the Liverpool School of Tropical Medicine, of which an account was given in *The Times* of yesterday.

Major Ross said it was too early to speak of the gangs employed in sanitary work at Freetown, but the number of mosquitoes in the centre of the town had certainly been largely reduced. There were hardly any to be found in Dr. Logan Taylor's house, where formerly they used to swarm, and the same state of affairs prevailed at Government House, where Major Ross stayed with the Governor. Dr. McKendrick, of the Indian Medical Service, who had been deputed to watch over the operations of the expedition on behalf of the Government of India, was not bitten once during a whole month. In former days he would certainly have been bitten at least five or six times a day. Major Ross said he had no doubt that the expeditions would be successful and that they would be continued as long as necessary. At Lagos the measures adopted by Sir William Macgregor, were admirable and he was confident of success. The Governor of Accra, Major Nathan, was anxious to start similar work there at once, and doubtless experts would be sent out immediately by the Liverpool School of Tropical Medicine. On the whole, Major Ross expressed himself as being well satisfied with his tour. Personally he did not think the health of the Coast was as bad as was painted. He believed that by minute attention to details the place would be made as healthy as India for Europeans. Old West Africans were sober and careful and generally live in very good health. It was the improvident newcomer who generally seemed to suffer. He had been informed that there was a high rate of mortality amongst such on the Cape Coast.—London *Times*, Sept. 3.

QUININE.

The following table will be of interest, showing as it does the highest and lowest prices quoted for quinine by manufacturers during the past ten years. Thus far this year the lowest price quoted by manufacturers in this market has been twenty-seven cents, and the highest thirty-six cents:—

Year.	High.	Low.	Year.	High.	Low.
1891 ...	30	24	1896 ...	27	17½
1892 ...	24	20	1897 ...	28	15
1893 ...	25	20	1898 ...	25	18
1894 ...	27½	25	1899 ...	40	21
			1900 ...	37	29

—*New York Drug Reporter.*

PLANTING NOTES.

SEEDLING APPLES FOR GRAFTING.—It is claimed that fully 90 per cent. of the Apple tree seedlings used in the United States for grafting purposes are grown near Topeka, Kans. Shawnee County, Kans, is said to now have at least 600 or 700 acres devoted to the growing of these seedlings.—*Journal of Horticulture.*

WOOD ASHES as a fertiliser are specially valuable used in conjunction with stable manure. They contain the elements of potash and phosphoric acid in proportions of about 5 and 2 per cent., the potash sometimes running to 7 per cent. The Canada wood ashes made from hard woods are the richest.—*Journal of Horticulture*, Aug. 29.

"TROPICAL TIMBERS AND THEIR RINGS OF GROWTH" is the title of a paper contributed by Mr. Herbert Wright, A. R. C. S., of the Peradeniya Staff, to "Indian Gardening and Planting." It is of considerable and permanent interest, and we are reproducing it in the *Tropical Agriculturist.*

To Drive Mosquitoes Away.—Oil sassafras oil wintergreen, equal parts. Apply to exposed portions of body. The oils of cajuput and origanum are also very effective, but they have a rather unpleasant odour.—*Journal Trop. Med.*

Poor Tea !—What Next ?—A recent post has brought us from the Department of Land Records and Agriculture, Madras, Agricultural Branch, Vol. II, Bulletin No. 45, namely, on "A Tea-Eelworm Disease in South India," by C. A. Barber, Government Botanist, Madras. And we read:—

The disease in question was first brought to notice by Mr. A. Brown of Glenfruen Estate, Devala, who sent a parcel of tea seedlings to Dr Watt while he was on tour in Madras. After a hasty examination the plants were forwarded to the Royal Gardens, Kew. It turned out, however, that the seedlings had been destroyed by nematode worms. The whole correspondence, which was freely reported in the *Madras Mail*, has caused a good deal of perturbation among the tea planters of the Wynaad district, and the object of the present notice is to allay their fears, while at the same time it is hoped that their attention will be drawn to this class of parasite and that a sharp look-out will be kept in case of the spread of the disease to other nurseries. I wish at the same time to direct the attention of planters and others interested in agriculture to the whole subject of root-nodules. These are not always beneficial, nor do they at once determine the plant bearing them to be leguminous and therefore nitrifying. It will also be seen later on that leguminous plants may also be attacked by the eel-worm, and sowings of such plants for the purpose of green-dressing must be conducted with a certain amount of caution. The particular outbreak at present referred to is undoubtedly caused by the root-eelworm, Heterodera radicicola (Greef) Muell. The attack has proved to be a very destructive one for tea seedlings and is confined to the nurseries of the Glenfruen Estate. A careful examination on the spot has brought to light several interesting facts. The virulence of the outbreak fully justified the fears expressed by the manager of the estate, on the other hand it is strictly localised and there does not appear to be any great fear of the pest spreading.

And then follows a full account (and illustrations) which we may give in our *Tropical Agriculturist*. There is no need for alarm: persistent neglect of weeding, etc., is to blame for the visitation for we are told:—

Heterodera is particularly fond of old and ill-kept garden land, and I accordingly attempted to trace it to some place whence it might have been distributed in the manure. The examination of the manure heaps near the house and their weeds, however, completely disposed of this idea, and the plants found near the house seemed to be free from the disease. The conclusion arrived at was that the eelworm had been on the place for a long period, probably dating from the time when the coffee bushes were allowed to run wild. They had then gradually established themselves, and this especially in the Ageratum, which, lying about in half-dead heaps, would form an ideal ground for the pest. Having adapted itself to this composite it was carried all over the estate, and, arriving at the nurseries, found the young tea plants and the neighbouring weeds suitable hosts.

Circumventing the Mosquito.—One of the most dangerous breeding grounds of Anopheles is the pool generally to be found outside the bathroom of an Indian bungalow, says the *Madras Mail*. It is more dangerous even than the pools to be found in the native quarters, because, being composed of cleaner water, it is more likely to be fit for the growth of the green water-weed on which the larvæ principally live. In searching the pools, etc, in our compound for larvæ it is little use attempting to do so by merely looking into the water. Dip a tumbler into the water and hold it with its contents up to the light. If the water is muddy, wait till it settles. If there are any larvæ present, it will be easy to see them. They are minute worm-like bodies more or less transparent, with a large head and a pair of black eyes. The tail looks as if it were forked, and the animals are characterised by vivacious wriggling movements. Once seen they will always be easily recognised again.

Interesting Planting Experiments.—The German Foreign Office Report for 1901 contains an interesting account of an attempt to improve the vegetation in the vicinity of Swakopmud, the port of German South Africa. The neighbourhood is a dreary and barren desert of sand, and it was necessary to choose such plants as required but scanty soil, could stand considerable changes of temperature, and resist excessive dryness. It was also desirable to guard against the strong sea wind. The latter difficulty was met by planting a screen of wild Tobacco, which, while flourishing well, presented an interesting instance of adaptation to altered conditions. The leaves, which at a distance from the sea are well known to be large and thin, became in the new habitat narrow and thick. Young trees of Oak, Pine, Juniper, Eucalyptus, Date Palm, Vine and Fig quickly perished, but the seeds of the Date Palm and Port Jackson Acacia promised good results, another instance of adaptation to environment. —*Journal of Horticulture*, Aug. 15.

Preserving the Form and Colour of Flowers.—From a French botanical journal we extract several recipes for preserving the form and colour of flowers. One method is to immerse the stem of the fresh specimen in a solution of 31 parts by weight of alum, four of nitre, and 186 of water, for two or three days until the liquid is thoroughly absorbed, and then to press in the ordinary way, except that dry sand is sifted over the specimen, and the packet submitted to the action of gentle heat for twenty-four hours. Another method is to make a varnish composed of 20 parts of powdered copal and 500 parts of ether, powdered glass or sand being used to make the copal dissolve more readily. Into this solution the plants are carefully dipped; then they are allowed to dry for ten minutes, and the same process is repeated four or five times in succession. Plants may also be plunged in a boiling solution of one part of salicylic acid and 600 of alcohol, and then dried in bibulous paper. But this act should be very rapidly done, violet flowers especially being decolorised by more than an instantaneous immersion. Red flowers, which have changed to a purplish tint in drying, may have their colour restored by laying them on a piece of paper moistened with dilute nitric acid (one part to ten or twelve parts of water), and then submitting them to a moderate pressure for a few seconds. But this solution should never be allowed to touch the green leaves, as they would be decolorised by it.—*Journal of Horticulture and Cottage Gardener*, Aug. 29.

PENRHOS ESTATES COMPANY.

THE DIRECTORS' REPORT

was as follows :—

The Directors have pleasure in laying before the Shareholders their Report and Accounts for the year ending 30th June, 1901.

The amount of Tea secured was 234,171 lb.—199,143 lb. on Estate account as against an Estimate of 200,000 lb., showing an increase over last season of 2,589 lb., and 35,028 lb. manufactured from bought leaf, a decrease, as compared with last season, of 11,259 lb.

The Comparative Table for the past five seasons is appended, and will doubtless be found of interest ;—

	Crops in lbs.	Cost laid down in Colombo in cents.	Or without Manure.	Nett average Price.
1896—1897	155,625	27·52	26·31	36·42
1897—1898	145,250	26·23	25 65	39·12
1898—1899	158,106	25·41	24·05	41·03
1899—1900	196,554	23·74	22·32	37·46
1900—1901	199,143	26·29	23·88	34·89

These figures apply to the Estate Tea only and although the average price realised has fallen below that obtained last season, yet in view of the extremely depressed state of the market during a great portion of the year the result cannot be regarded as otherwise than satisfactory.

The total Crop secured cost, including Manure, 25·67 cents per lb. laid down in Colombo, and realised a nett average price of 33·25 cents.

The comparatively heavier expenditure during the present season is accounted for by the fact that it has been found necessary to lay out some R1,200 on the erection of new lines, and repairs to existing ones. A portion of the Estate has also been re-drained, and on Dahanaike a field of twenty acres, which was making no progress, has been experimentally manured, and it is anticipated that this will show considerable improvement in the near future.

During the year a sum of R3,101 has been spent on the Planting and upkeep of new clearings and R1,082 on extensions to Factory, this latter being found necessary in order to make thorough provision for the rush of crop in the busy months of the season. After payment of the Interest on Debentures viz. R3,030, the amount available for distribution inclusive of R285 brought forward from last account, and a surplus of R155·58 on the estimated proceeds of last season's Tea, comes to R12,142·38, which is equal to slightly over 8 per cent on the Capital of the Company. The Directors recommend that this should be apportioned as follows :—

	R.	c.
By payment of a Dividend of 4 per cent	6,000	00
By payment of Bonus to Superintendent	500	00
By placing to Reserve Fund ..	4,500	00
By carrying forward to the next Account	1,142	38
	12,142	38

The acreage of the Company's Estate is as follows ;—

Old Tea	548¼	acres
Tea under 4 years	7¾	do
Tea under 2 years	44	do
	600	do
Forest ..	42	do
Chena, &c. ..	296	do
Total acreage ..	938	

During the year Mr. W Kingsbury retired from the Board owing to his departure from the Island, and his place has been filled by Mr. G W Suhren.

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It will be necessary to appoint an Auditor for season 1901-1902.

THE AMALGAMATED TEA ESTATES COMPANY, LIMITED.

REPORT OF THE DIRECTORS,

for the year ending 30th November, 1900, to be submitted to the fifth annual ordinary general meeting of shareholders of the Amalgamated Tea Estates Company, Limited, to be held in the registered office of the Company, 22 West, Nile Street, Glasgow, on Tuesday, the 27th day of August, 1901, at 2 o'clock p.m.

The Directors beg to submit the accounts for the year ending 30th November, 1900. The crop gathered amounted to 2,582,657 lb. against 2,143,710 lb. in 1899. The effect of the increase in yield from the Company's estates was, unfortunately, neutralized by a drop in the price. The average price was 9·90d per lb. against 10·29d during the previous year. The accounts now submitted show a balance at credit of profit and loss account of £52,869 3s 8d. Against this sum are chargeable :—Commission on profits to managers of estates, Agents in Calcutta, and Secretaries ; interest, discount on bills, &c. and dividends paid to the preference shareholders, which total £29,125 17s 6d, leaving a balance to be dealt with of £23,743 6s 2d. Out of this balance the Directors propose to pay a dividend at the rate of 5 per cent per annum, payable on the 31st August to the ordinary shareholders, on the amount called up, which will absorb a further sum of £14,350 10s 0d, and leave a balance of £9,392 16s 2d to be carried forward to next year. Considering the crisis in the tea market, this result is encouraging and satisfactory.

As explained in the circular letter of 7th August, addressed to the shareholders, Mr P R Buchanan, the Special Adviser to and Visitor for the Board, proceeded to India by mail of 4th January last, and he, along with the managing Agents in Calcutta and Colombo, and the Company's Visiting Superintendents, has been able to effect considerable economies in working without impairing the efficient up-keep of the estates, which should help the results of 1901 and subsequent years. In the circular letter of 7th August above referred to, and in the circular of 9th ultimo, the Directors gave information regarding the position of the tea industry and the prospects of the Company.

Advices from the estates show that they are maintained in good cultivation. The estimated yield for 1901 is 2,915,760 lb. The total area now under cultivation is 13,355 acres. The Company's investment in the Kanan Devan Hills Produce Company, Ltd., remains as before, and the Directors are pleased to be able to report that the prospects of that Company continue to be favourable. This is especially the case in regard to its cinchona properties, the visible supply of that product being at the moment moderate and the prices remunerative. In terms of the Articles of Association, one of the Directors, viz., Mr A B Murray, retires at this time, and is eligible for re-election.

The Auditors, Messrs. Alexander Sloan & Co., C.A. retire, and offer themselves for re-election.

RATWATTA COCOA COMPANY, LTD.

The annual meeting was held today at the offices of Messrs. Geo. Steuart & Co. The business was entirely formal as indicated in the notice calling the meeting. Mr. Jeffries was re-elected a director and Mr. MacDermott was re-appointed auditor for the current season.

The directors were also authorised to borrow further money as mentioned in the notice.

REPORT.

The Directors beg to present their Report for season ended 30th June, 1901, together with the audited accounts for the same period.

The Cocoa Crop amounted to cwt. 324-0-12, and sold at an average of about R44·17 per cwt. The estimate was cwt. 400.

The Tea Crop secured, including about 7,600 lb. from bought leaf, was 86,229 lb. and sold at an average of about 25cts. per lb. The estimate was 81,000 lb.

The profit for the year after charging all expenditure to Revenue Account is R3,410·86, which, however, disappears and becomes a deficit of about R4,000 when interest, Directors' Fees, Secretariat, &c. are brought into the reckoning.

The future outlook from an agricultural point of view is satisfactory. Young fields are coming into bearing, and there will be no more Capital Expenditure, with the exception of the cost of additional withering room to meet the increase of the crops. The monetary position of the Company, however, is embarrassing, and the Directors beg to invite the Shareholders to come forward and assist them in placing the finances on a good sound basis. This is the most important business before the Company at present, and it is hoped that Shareholders will not neglect this opportunity of providing the necessary help.

The estimated Crops for the coming year are 400 cwts. of Cocoa and 120,000 lb. of Tea against an expenditure of R36,895·01.

The acreage of the property as at present cultivated is

Cocoa planted in	1893	72 acres.	
do ..	1894	85 ,,	
do ..	1895	56 ,,	
do ..	1898	10 ,,	
			223 acres.
Tea in full bearing		119 acres.	
do planted in	1896	24 ,,	
do do ..	1897	100 ,,	
do do ..	1898	75 ,,	
			318 acres.
Total in cultivation			541 ,,
Jungle			180 ,,
Grass			3 ,,
Total acreage			724 ,,

Mr. Gordon Pyper having been appointed Managing Director for a term of years, Mr. Edmund Jeffries only retires from the Directorate by rotation, but he is eligible for re-election.

An Auditor has to be appointed for the current year. The appointment rests with the meeting.

EILA TEA COMPANY OF CEYLON, LTD.

THE REPORT.

The Directors herewith submit their Report and Accounts for the year ending 30th June.

The crop on Eila estate was 244,775 lb. against an estimate of 281,500 lb. and on Kanangama estate 88,568 lb. against an estimate of 135,000 lb.

The average price of the tea, which has all been realized, was 24·16 cents per lb. as against 30·38 for the previous season and the cost of the same was 22·83 cents.

During the year a further instalment of £500 was paid to the Standard Assurance Company, in reduction of their loan per £7,000. The amount now standing is £5,500.

The Directors have great regret in reporting the low prices which the Company's teas have fetched during the season, especially as every effort has been made to maintain them by finer plucking than has been hitherto customary. This however is the experience of practically all tea estates. The crop on Kanangama turned out very short of the estimate, for which two facts are accountable—namely the finer plucking resorted to in consequence of the depression of the market and the unusually severe and persistent attack of helopeltis which has visited the estate. The Superintendent is now taking further measures in order to try and cope with this pest which he hopes will be successful.

The result of this combination of low prices and short crop and the necessary consequence of enhanced cost of production is a loss of R4,096·65 on Kanangama's working for the season. Eila has made a profit of R11,712·73 and a matter of congratulation is that the young tea has come on well and will in time be the finest tea on the estate.

The nett profit for the season is R779·54, which the Directors propose to carry forward to the next season's account.

The Estimates for the current season provide for a crop of 367,050 lb. Tea at a cost of R78,815·65 which the Superintendent considers he will be able to work to.

The Estates of the Company now consist of:—

Eila ...	626 acres	5	years old and upwards.
	90 do	4	do
	240 do		Forest.
	956 acres.		
Kanangama ...	215 acres.	5	years old and upwards.
	108 do		Forest.
	323 acres.		

During the year Mr H G Bois was elected to the Boards of Directors in place of Mr F W Bois who has left the Island.

Mr G F Walker retires in accordance with the Articles of Association, but being eligible offers himself for re-election.

It will be necessary to appoint an Auditor for eason 1901-1902.

AUSTRALIAN EUCALYPTUS TIMBERS.—The Journal of the Society of Arts, for September 6th, contains interesting information about the Australian Hard Woods of commerce. The "Jarrah" (Eucalyptus marginata, Sm.) is the principal tree in the forests of Western Australia and attains a diameter of 2 feet in 40 or 50 years. It grows best in that part of the country upon which the heaviest rains of the season fall. The wood which is very hard resists the attacks of Chelura, Teredo, and termite and in consequence of this property may exist in an almost perfect condition of preservation for nearly 100 years. Such a wood can be used to advantage in the construction of houses, harbours, bridges, etc. The "Karri" (Eucalyptus diversicolor, F Muell,) often known as the "white gum," comes a good second to "Jarrah." When mature the trees are of straight growth and tower skywards for great heights without branching. It is not unusual to fell trees 200 feet in height. This species grows well in the humid portions of the temperate region of West Australia where the annual rainfall is from 30 to 40 inches. The wood is extensively used for street blocking and in the paving of the London streets a very large quantity has been used. In the Peradeniya Gardens, there are half a dozen species, including "Karri," "Iron bark," and the "Lemon-scented gum tree." In the Hakgala and Nuwara Eliya districts there has been a recent importation of "Eucalyptus robusta."

THE FRUIT OF UGANDA.

AN INTERESTING CHAT.

We had a call yesterday from Mr. A Whyte, F.Z.S., F.L.S., director of the scientific department of the Uganda Administration, who is on his way Home on leave of absence. In the course of his visit, Mr. Whyte informed us that Uganda is a beautiful country. Its great drawback is its distance from the sea—700 miles from the port of Mombassa. The railway from Mombassa, however, is being vigorously pushed on, and some 500 miles have already been laid. Some very heavy cutings and embankments occur on the remainder of the route, but it is expected that the line will be finished about April of next year. Two new steamers are being built to add to the one at present plying on Lake Victoria Nyanza, which will take goods from the railhead to Entebbe, the present capital of Uganda, on the western shore of the lake, where a breakwater is being constructed. It is very probably that this will be the permanent capital.

Mr. Whyte has opened up what he himself already regards as beautiful botanical gardens, and believes that in course of time they will be amongst the finest gardens in the East. The climate of Uganda is almost perfect. The temperature seldom rises above 80 degrees, or falls below 60 degrees. It is difficult to say what will not grow in Uganda, excepting European cereals, which have not proved satisfactory. There are two wet seasons in the year, and scarcely a month without rain all the year round. The rainfall is not very heavy, but is well distributed, and therefore of greater value. Uganda is a great rubber country, and Mr. Whyte informs us that he has seen more rubber-yielding plants in the forests of Uganda than in any other tropical forest. We may say that Mr. Whyte has had a large experience in the interior, being formerly Director of the British Central Africa Administration. There is a dense native population. He describes the Waganda as a very intelligent and interesting people, especially amongst the better classes. The lower orders have been rather chief-ridden, but are now developing into good labourers. Some of the Waganda are remarkably well educated, and write a good hand. This is the result of missionary enterprise, both Protestant and Roman Catholic, extending over a long period of years. It is a curious fact that right over the long distance of country between Uganda and the coast only barbarians are found. The development of the Waganda can only be attributed to the work of the missionaries; indeed, the celebrated Missionary Mackay, when he desired to leave the country, was practically made a prisoner by them, so loth were they to lose him. Trade is being gradually opened up by the Banyans, who are beginning to arrive in the country, and it is well-known that these men are expert traders.—*Natal Mercury*, Aug. 23.

OUR PEARL OYSTERS AND THE EXPECTED EXPERT.

SPECIMENS TO BE SENT TO PROFESSOR HERDMAN.

Professor Herdman who is expected in January next year to make personal investigation of our pearl banks is to be supplied with a few specimens of the oysters beforehand. A representative of this paper learnt from Captain Donnan today that these specimens will be forwarded shortly, and was also informed that this fact will in no wise affect the projected visit of Professor Herdman. It is likely that Captain Donnan will visit the pearl banks shortly to secure these specimens but the date of his departure has not been settled yet. The actual reason for the sending of these specimens could not be ascertained.

CACAO PLANTS FROM THE DUTCH EAST INDIES.

The following regulations made by the Governor, with the advice of the Executive Council, are published for general information:—

Regulations under Section 3 of "The Insect Pest and Quarantine Ordinance."

1. The importation of Cacao "plants" from any part of the Dutch East Indian Colonies is prohibited.

2. The Principal Collector of Customs shall destroy all Cacao "plants" imported from any part of the Dutch East Indian Colonies and no compensation shall be payable in consequence of such destruction.—*Gazette.*

A MOSQUITO NET FOR THE TROPICS.

Mr Carmody, in the American "Journal of Tropical Medicine," has sketched a mosquito net for travellers in hot countries. It is attachable to the ordinary umbrella or sunshade, and serves the double purpose of keeping off the sun by day and the insects by night.—*Globe*, Sept. 13.

USEFUL NOTES ON EVERYDAY TOPIC.

DIPHTHERIA AND HORSES.

In a leading Bacteriological Magazine, Dr. L. Cobbet puts on to horses some quilt with relation to the spread of diphtheria. He shows that horses are peculiarly liable to this disease. In 9 out of 13 animals he found the diptherial bacillus and he infers from his observations that the horses acquire diphtheria naturally and do not in many cases suffer any serious inconvenience from it.

GRAFTING.

A recent investigation of the physiological and practical sides of grafting by Dr. S. Daniel lead him to lay down the following conditions for successful grafting:—1. The maintenance of the adhesion of the plants. 2. The maintenance of the vitality of the scion and stock. 3. A suitable temperature neither too high or too low. 4. The maintenance of the life of the graft up to a definite level. 5. The possibility of the graft to get back the moisture lost in cutting. 6. The necessity of never leaving, after the operation, the level of the graft under water.

MALARIAL MOSQUITOS.

Messrs. Grassi & Noe have discovered that the filarial or malarial organism passes from the mosquito to man only in the act of biting. They explain the

interesting way in which these larvæ are passed in the act of biting and not when the mosquito is sucking the blood. Dr. Stephens and Mr Christophers have examined a series of native villages in Sierra Leone and find that 50 to 90 per cent of the children were infected with malaria. In all the villages the malarial mosquito (Anopheles) was present and each hut contained one or more cases of infected children and infected mosquito. Thus the native in these parts is the prime agent in spreading malaria to Europeans.

MANGO GRAFTS FROM BOMBAY FOR FLORIDA.

The American Consul at Bombay has lately sent a dozen mango-grafts from nine selected varieties grown in Bombay to Florida, as a horticultural experiment. They were packed in boxes with plate glass lids, and he hopes that as tropical fruit introduced into America generally improves on cultivation, some very superior mangoes may be the result of his enterprise.

PRODUCE AND PLANTING.

THE TEA DUTY.

We are glad to find that the question of the tea duty is not allowed to slumber. The increased duty was a blow to the industry which there have been attempts to minimise, but no apathy on the subject or acceptance of the inevitable can alter the fact that an act of injustice has been committed against the tea grower. In a letter to the Financial *Times*, "Kar Guzar" deals with this duty question, and he protests against this burden on the producer. He says: "Messrs. Finlay & Co., in their circular addressed to the shareholders in their companies, and published in your issue of the 10th inst., rightly stated that the sudden increase of 50 per cent to the duty previously levied on tea has prejudicially affected the industry. They place the amount of their losses by it at £60,000, and at the rate of 1¼d per lb. The lower the tea produced is classed the greater is its producers' loss. The quality of tea depending upon the lay of the land, the altitude at which it is grown and the qualities contained in the soil, it is not in the producers' power to vary its quality at pleasure; he may pick finer or coarser, he may improve the appearance of the tea, but its chemical qualities will remain the same to the end of the chapter. We are told that the average price of Indian tea before the levying of the surcharge was 8d without duty. To get an average of 8d a lb. much tea must have been sold at 4d per lb, some at 1s, but we must not think, because one producer received 12d a lb for his tea and another received only 4d, that the one was intrinsically worth three times the price of the other. The difference in price is not regulated by its intrinsic properties—the prices the consumers pay the merchant are regulated by the relative intrinsic values of the teas—but the price the merchant pays producers by the amount of duty plus the price he can afford to pay to equalise its cup value to the consumer.

THE INEQUALITY OF THE IMPOST

is pointed out. "The duty falls unequally on teas of different qualities, and it forces merchants to buy the higher-classed teas to the neglect of the others. A rate of duty which produces a revenue equal to 75 per cent. of the whole value of the industry, a rate of duty varying from 50 per cent. to 150 per cent., is out of all proportion to its value. The price to be paid to the producer will be reduced by every penny that the merchant will not be able to recover from the consumer. If the merchant wishes to sell two teas to the consumer, the one at double the price of the other, it will be necessary for him to purchase the lower-classed one at a third of the price of the other—hence we may conclude that every 2d added to the duty takes a penny per lb off the prices received for all teas below a certain value. When the duty stood at 4d low-classed teas were handicapped 2d per lb, and the average, or 8d, teas by 1d. Now that the duty has been raised to 6d, low-classed teas are handicapped 3d on the pound of tea, and average teas 1½d, as against the higher-classed teas. The duty as it is now levied acts as a direct tax on the majority of us producers. The amount levied from me as a war tax I estimate at £2,000 per annum. It would have been less had the merchants not succeeded in passing so much free of increased duty and would have been greater had my teas not been in some request for outside markets. It is, I think, much to be regretted that Messrs. Finlay & Co. limited their statement to a bare chronicle of results, and did not boldly state in what manner and why the duty has borne, and is still bearing, hardly on our industry. The Chancellor of the Exchequer, when introducing his Budget, stated his reasons for having selected tea as a fit article for increased taxation: (a) because it was not an article of manufacture in this country; (b) it is largely consumed, and (c) at the time of the Crimean war the duty on tea stood at 1s 6d per lb, and that it was promptly raised 3d with practically no objection from anybody concerned. He then went on to state that even with the addition of 2d per lb tea would still cost the consumer 2d per lb less than it cost the consumer in 1889, before the duty was reduced from 6d to 4d per lb, and wound up by saying that he did not think the population at large will have any very fair ground for complaint at the amount which they will be called upon to bear towards the cost of what the vast majority of them believe to be a necessary war. It is very evident from what fell from the Chancellor's lips, as from the tenour of the debate in Parliament, that the Chancellor and also Parliament intended that the tax should be levied from the tea-consuming public, and not from the producers. I am one of the vast majority who deem the war to have been a necessary war, but I deem it wrong to attempt to levy any special portion of its cost under a special tax from the persons we made war to protect. If we are to be taxed, by all means tax us, but levy the tax in such a manner that it will not act unequally in its incidence. Had the duty fallen to the lot of the consumer to pay, as it was intended it should have done, the reproach that it added to the poor man's burden would have been a just one. Why an article produced and manufactured by a large number of his Majesty's subjects residing in His Majesty's colony, as also in a Dependency of the British Crown, should be taxed, and articles manufactured within the United Kingdom should be exempted, we can leave those who talk so glibly of consolidating our Empire to inquire into; the principle therein propounded found favour with Parliament, and with the rest we have no concern, and it is most certainly largely consumed."

THE OBJECTIONS TO THE TAX

are urged. "At the time of the Crimean War the duty certainly stood at 1s 6d, and was promptly raised 3d per lb, but in 1852 it stood at 2s 1d. was reduced in 1853 to 1s 10d, and again in 1854 to 1s 6d per lb Thus, when it was raised 3d it still stood at 1d per lb less than it had previously done. A duty levied on trade will fall either on the consumer or the producer, in no instance on the merchant, and in some instances, as in the present instance, it may act to his direct advantage. In 1854-55 the consumers, acknowledging the necessity of levying a duty to meet war expenditure, could not fairly object to having the rate of duty raised, more particularly as the duty and surcharge together left them a penny better off than they had been in the habit of paying. Producers could not object, as the article taxed was of foreign origin, and they had no cause to object, as

they had possession of the markets of the world. What they could not sell to us they could sell elsewhere; our custom or our values did not rule their prices. Our case at the present day is wholly different. The major portion of the tea brought for sale to the English market is of British production, owned by British subjects. It is not an article that can be increased or decreased at will, and it is an article which spoils after a time in keeping. Our home market was, until recent times, our sole market, and is still our principal market; its prices regulate the prices for all; whatever we make must come forward, and we must accept the prices offered or not sell at all. When it was suggested in Parliament to substitute an *ad valorem* duty for a duty on weight, the Chancellor voted against the suggestion mainly on the ground that it had been tried and found wanting—I presume on the ground that it left openings to the quick-witted merchant to pass his goods through the Customs House at lower values than he should do. I cannot help thinking that where there is the will the way will be found, and that an industry which yields a revenue of several millions sterling is worth trying to do justice to, and for my own sake and for the sake of others I sincerely hope the Chancellor of the Exchequer will see his way to perfecting one. For my own part, I believe, a duty of 4½d on all teas valued at 6d and under and *ad valorem* duty of 75 per cent on all teas from 6d to 10d (all teas over 10d paying 7½d) would more than make good the loss the revenue might incur from the acts of the quick-witted merchants and if the Customs House officials find difficulty in assessing duty on the fractions of a penny, fractions of a penny might count as one."

Whether the views of the majority of producers are for or against "secret" or, as the supporters of the movement prefer to call them,

"PRIVATE" SALES OF TEA,

they continue to be bitterly resented by grocers. "Spectator," writing to the "Grocer," says, in the course of his letter: "Regarding Wednesday's secret sale itself, it was somewhat remarkable in that it partook of a more mysterious nature than anything we have yet seen. Competition amongst buyers to buy their own property afforded a special feature of interest, and the good old games of 'bluff' and 'puff' were merrily played, to the satisfaction of all concerned. It is, however, very apparent to the ordinary mortal that a scratch lot of Calcutta-bought tea is not the class of article which promoters of private sales have in view. The auction might perhaps be best likened to a bird-catcher's nest, with many decoy birds in various false feathers hopping about and greedily picking up gilded oats. Its attractions do not, however, so far appear to have ensnared any of the wary old birds who own the bulk of the fine tea gardens; perhaps they do not care to risk having their marks prejudiced in the country, or perhaps the Ceylon merchants who have tried the scheme may have whispered that the gilded oats only chaff after all. I understand that the Tea Buyers' Association anticipates that private sales may 'by a more extended range of prices in some way confer a benefit on the retailer.' There can be no doubt as to the question of 'extended prices,' as they will most certainly extend down for the merchants and up for the grocers, but with regard to the benefits to the retailers the prospects do not appear to be so clear. I would, therefore, suggest, Sir, with all due deference, that the General Purpose Committee of the Grocers' Federation invite the Chairman and a few other members of the Committee who drew up the private sales scheme, and have taken a leading part in the movement, to meet them next month and explain the advantages likely to accrue to the grocer. By this means the grocers would be enabled to gather much valuable information, and the representatives of the Tea Buyers' Association would not only be afforded an opportunity of gaining increased notoriety but if their scheme is found to possess the merits claimed for it, their names would probably also be handed down to posterity as public benefactors. If I recollect rightly such a meeting took place at the time of the pound-draft dispute three years ago, when, I believe, the grocers were given to understand that the the protection of their interests was one of the principal objects for which the London wholesale trade existed. It is probably fresh in the memory of many of your readers the quarter from which that unfortunate disturbance emanated. In conclusion, I would venture to take the liberty of most strongly impressing upon the General Purposes Committee the extreme importance of giving this subject of secret auctions their most serious attention, as if allowed to continue without protest or action from the country it may, although the Ceylon merchants destroyed the recent public sale boycott, yet develop into a most dangerous situation for the retailers. I understand on good authority that many leading Indian and Ceylon merchants intend to adhere to the policy of the 'open door,' and I know that there are several powerful blenders and many old-established leading dealers who look upon the now movement with suspicion, and are prepared to support the public saleroom. To these firms I would most earnestly recommend the grocers to accord their support and countenance, and, by making common cause with them, stamp out once for all the most mischievous scheme that ever was concocted for benefiting a few at the expense of many."

PARA RUBBER IN CEYLON.

Sir,—It may interest some of your readers to know that the last consignment of 2 cwt. of Para rubber from this estate sold in the London market at 3s 9d per lb.

My coolies are regularly bringing me in at the rate of ½ lb. dry rubber per cooly. Considering that some of the trees now being tapped are not in a very favourable location for a good yield, being up a hillside, the result is very satisfactory.

	R.	c.
Taking value 3s 9d in rupees as ...	2	70
And 1 lb. rubber, costing two coolies, C R average, if 35 cents ..	0	70
Leaves a clear profit per lb. of ...	2	00

This includes cost of curing it, as the same coolies have to do it, in the middle of the day. The result may not be so satisfactory as some well-known Kalutara estates, but is still good enough.

If only all our "dadap" trees were Para rubber!
—Yours, &c. FRANCIS J. HOLLOWAY.
Kepitigalla, Matale, Sept. 22nd.—Local "Times."

INDIAN TEA NOTES.

GREEN TEAS.

(*From a Planting Correspondent.*)

"You will probably find that the Indian Tea crop will not be *short at all*. I believe on pretty good Calcutta authority the 'short crop of output' report will not long hold good; however, we shall soon see. It is difficult to say much about the future of Ceylon "Green Teas," but it would be interesting if Mr J N Campbell of Moray or Mr Hamlin of Darrawella or Mr Wright of Brunswick would publish their *nett* average for last twelve months' shipment. If the returns have been reasonably fair ones the output of these teas would be increased, which is to be desired, especially from low-country estates where black tea averages would be lower than Dikoya and Maskeliya ones.

"I still think that all estates getting the bonus should send their account sales or copies to the 'Thirty Committee,' not necessarily for publication, but to enable the Committee to judge if the business is likely to prove a paying one in the future."

THE CAMPHOR TRADE OF FORMOSA:

INFORMATION FROM MR. DAVIDSON, AMERICAN CONSUL.

Pending the arrival of a copy of Mr. Davidson's exhaustive book on Formosa, it may be well to mention a few of the facts contributed by him in the course of conversation. First of all, it is a mistake now to talk of camphor from Japan, China or even Borneo. The high prices and monopoly during the war, completely used up all the available camphor in both China and Japan; while the Bornean article is so inferior as scarcely to be worthy of the name of camphor proper. Still, a considerable quantity of camphor enters the American market even now as "Japan," and Mr. Davidson found it difficult to convince merchants in New York that it was really the product of Formosa, but exported *via* Japan and there packed differently. Two years ago, Japan shipped 1,500 lb. of camphor, the very last got from her own trees.

Mr. Davidson does not give much encouragement to Ceylon or any other country to grow camphor trees in order to secure a profitable, as well as marketable, product. The indigenous forests of Formosa are of a very large extent, and it will take a long series of years before they are exhausted, even if

THE WORLD'S REQUIREMENTS

should increase a good deal over the present standard. So large and rich are some of the Formosan forest trees, that Mr. Davidson has known one tree yield as much as

£200 WORTH OF CAMPHOR.

Four per cent is about the best yield from the richest part of the tree. Should competition by any chance arise, the Formosan monopoly can be worked to run down the price for a time, in order to shut out rivals. All this is not encouraging.

GREEN TEA.

Mr. Davidson further made reference to Ceylon Green Teas and mentioned how he was in the office of a leading New York tea firm and witnessed a testing of a package of Ceylon "Greens." The verdict was,—a fair average green tea as to make and appearance, but with the Ceylon flavour, to which American consumers are not attracted. We mentioned how we learned in 1884 from the largest American buyer of Japan tea, that every ounce was artificially faced; and remarked that surely now the Americans would prefer to use a pure article. "Yes," replied Mr. Davidson, "but then your Ceylon Greens are fermented." (There he must be mistaken: no fermentation takes place in the preparation of Ceylon green tea; but this shows how a wrong belief arises and spreads.)

"But the Oolongs of Formosa are quite pure and natural, and they must long remain a favourite tea in America."

It will be seen from all this, that Mr. Davidson is a firm believer in Formosa and her products; and it is pleasant to find the most made of one's adopted home. Mr. Davidson is a great lover of botany, horticulture and tropical cultivation generally. He has long known and appreciated the *Tropical Agriculturist*, and he was delighted to be able to study our Review of all planting products prefixed to the "Handbook and Directory." Mr. Davidson was curious to know whence the first camphor seed or plants received in Ceylon, came? He supposed from Japan.

PEPPER AND COFFEE EXPORTS FROM WESTERN INDIA.

We are indebted to Mr. C. W. Layard, the successor of our lamented friend, Mr. Ralph Tatham, as agent for Messrs. Arbuthnott & Co., Tellicherry, for the annual report and statistics of the above products for the year ending 30th June. [Given as a *Supplement* to this issue]. It is surprising to see how well coffee keeps up, considering all that has been said of disease and decay in Coorg and Mysore. The large proportion, too, of native-grown coffee is noteworthy and seems to indicate that if prices were only satisfactory, the export of our old staple from Southern India could be maintained, for some time to come. As regards Pepper, the same rule of an alternate good and poor crop seems to prevail: the returns for five past seasons comparing thus:—

1896-97	...	Export of Pepper	cwt.	222,383
1897-98	...	,,	,,	125,231
1898-99	...	,,	,,	237,041
1899-00	...	,,	,,	168,001
1900-01	...	,,	,,	211,987

The value of last season's pepper crop (July 1900 to June 1901) is given at R7,949,512, or close on 8 millions of rupees. Would that Ceylon could produce enough pepper for its own requirements and still more export even as much as it did in 1739 when the Dutch sent away 465,000 lb. chiefly from Kandyan districts.

NEW PRODUCTS IN ASSAM.

The Report of the Director of Land Records and Agriculture in Assam contains notices of the cultivation of "sisal" hemp at Dauracherra, in Sylhet, which is being energetically pushed, and of experiments made by Babu Debeswar Gohain and Mr. Matilal Haldar in growing sugarcane on a considerable scale, and the manager of the Bambgaon tea estate in growing "balam" rice and husking paddy by steam machinery. These experiments, as well as the experimental cultivation of the rubber tree on a considerable scale in the Charduar plantation by private enterprise and of rhea fibre in more than one locality, are all of interest and fraught with importance to the future prosperity of the province, and the Chief Commissioner remarks that he is glad to encourage them in every reasonable way.—*Bombay Gazette*, Sept. 24.

PLANTING "DAYS OF OLD" IN CEYLON.

BY A VETERAN WHO ROSE FROM S. D. TO BE CHAIRMAN OF THE P. A., AND M. L. C.;

BUT NOT TO MAKE £50,000!

1864-5 AND —— 1901.

Thank you very much for sending me so promptly a copy of the "1901 Ceylon Handbook and Directory," which is to me most interesting and which I find almost as necessary as when I lived in Ceylon. I have beside me while I write—I have unearthed it for purposes of comparison—your Handbook and Directory of 1864-65, which I remember considering at the time a most imperfect and inaccurate work because I had been a few months in Ceylon before it came out, and my name did not appear in it. I suppose I was fonder of seeing my name in print then than I am now, and felt the disappointment.

But despite this (to me) great blemish, I am prepared at the present moment to pass an examination in 1864-65 Handbook against any man living, the Editor not excepted!*

At that time I lived in the usual Sinne Durai's mud-hut with a library consisting of a Bible and Prayer-book, Smile's Self-help, Burns' Poems and a few greasy yellow-backs which had been read and re-read, and often by the dim light of a cotton wick floating in coconut oil in the inverted top of a bottle as a red pedestal, have I read myself to sleep over the Ceylon Directory. To go to sleep once, when reading a book is a doubtful compliment to the author; to go to sleep many times over the same book is the highest compliment you can pay him.

How times have changed in those thirty six years is vividly brought before me by your new Directory. A generation of planters and merchants has almost passed away; districts and estates have changed their names and vanished from view; the only things which strike me as not having changed are the native names of estates. I began life in Ceylon under Bas Gray on Algooltenne, the situation being procured for me by my good old friend and neighbour in Aberdeenshire, W. D. Gibbon. I think George Beck and myself are the sole survivors of the Hunasgiriya I knew at that time. I moved on from there to Gona Adika: Spencer Shelley and myself are the only survivors I know, of the Kadugannawa of that time. I look back with great pleasure on my Sinne Durai days; there was not much expected of Assistants in those days and though salaries were small, a rupee was worth 2s, and we had enough for our wants. Beer was sometimes 21s per dozen, so we did not drink it; but occasionally when a neighbouring Sinne Durai came on a Saturday night, a bottle of bazaar brandy—which seemed nectar then, but would be poison now—was procured.

I was fledged as a Periya Durai on Kinrara; but when I had been there a couple of months, I was sent down to take charge of Mahaberiatenne and Keenegahawella in the Dumbara Valley. George Greig and H.G. Mackenzie, now in London, were my neighbours, and after two years of Dumbara, I was promoted to the management of the Pendleton Group of estates where I remained for five years.

In 1873 I made my first investment: in Malvern estate, one of the group I had been managing. I bought early in the year when parchment coffee was worth about 14s per bushel and before the end of the year 25s and even 26s, I think, was paid for coffee. The result was that the value of the crop was considerably more than I paid for the estate, and the latter I sold immediately afterwards.

I think it must have been about this time that, at a social function, I said two things which I have very often been twitted with since:—1st, That every twenty-year-old planter should be shot to make room for younger men, as if he had not made his fortune in twenty years, he could not be much good. 2nd, That I had come to Ceylon to be Chairman of the Planters' Association, Member of the Legislative Council —and to make £50,000!

I lived long enough in Ceylon to modify the first statement, and I did not succeed in carrying out the last clause of the second.

From Pendleton I moved to Dimbula and Dikoya, and my life is much brightened by many friendships formed there.

Your Directory always carries me back to days far away, but they seem but yesterday, and it creates in me a great longing to re-visit Ceylon, which I live in hope of some day doing. Again thanking you for the big volume, which not only serves the practical purposes of today, but awakens pleasant memories of the past.—J. L. S.

* Well done! and yet we can recall many months of toil over that old-fashioned volume which stands Number 6 in our list.—Ed. *T. A.*

CINCHONA.

Mr. John H Stallman, of New York, is the author of a brief but interesting article on "Peruvain Bark as viewed from a Commercial standpoint," which appears in the July number of the *Journal of Pharmacology*. The article is mainly historical, and although Mr. Stallman finds a difficulty in saying anything new, he deals concisely with the data of the industry up to the present time. Mr. Stallman calls attention to the enormous increase in the consumption of cinchona of late years. The average annual production of bark in all countries twenty years ago, he says, was about 6,000,000 lb; in 1890 the production had increased to over 18,000,000 lb, which seems to have been the high-water mark. In 1900 the production was not over 14,000,000 lb, but of a high test, while the accumulated stocks in Europe had become much reduced. Appended to the article is an extract from a London price-list which says:—

To sum up, it appears that consumption has at last overtaken production, and increased shipments from Java will be required to supply manufacturers and make up for the expected deficiency from British East India and Ceylon, and in any case we fancy the days of quinine selling below 1s per oz. are numbered, and we think it safe to prophesy that the average value of the unit during the next three years will be above the average of 1896-98. The present state of the cinchona and quinine markets do not now seem to favour this view, especially if the increased shipments from Java (which already show an excess of 1,710,000 Amsterdam lb over 1900) should continue —*Chemist and Druggist*, Aug. 24.

"WHAT IS THE MOST CONVENIENT AND PROFITABLE SIZE FOR A TEA GARDEN IN CEYLON?"

This is a question which has recently come before us from several directions and owing to differing circumstances. For instance, it has been said that one reason why certain Limited Companies do not prosper as they ought, in proportion to the total area, and quality, of their tea-planted land, is that some of their "gardens" are very much detached and of too small an area to be worked profitably. Again, in answer to an enquiry as to why So-and-so does not make more out of his property,—we are often told that his acreage is too limited and he is weighted with a fully-equipped factory equal to double the leaf he has to bring in. All this makes one ask in turn as to what may be considered the proper average of extent planted to constitute a really profitable plantation. Now, of course, we are aware how great is the diversity in soil, in jât, in climate and other conditions in Ceylon, and how 200 acres of tea at a high elevation may be more fitted to be worked as a profitable property than 400 acres in the lowcountry, both being supposed to have adequate factories and sufficient labour supply. We directed an enquiry as to our problem to an experienced Visiting Agent and had, for answer, that in his opinion, "100,000 lb. of made tea" was the proper gauge of a really profitable plantation if turning out fairly good teas, and that the nearer the outturn was to 200,000 lb. the more certain the proprietor should be of an adequate, handsome margin of profit. That would clearly mean, estates of not less than 200 to 250 acres in bearing under any circumstances; and we suppose that this may really be taken as a minimum area for an efficient Superintendent and well-equipped factory? How then about detached estates in the hands of Limited Companies of as low an area as 150 acres? Should these be sold or exchanged as a favourable opportunity occurs, and would it not be a wise policy generally to aim at amalgamating small adjacent properties, so as to save in superintendence and factory working. The subject is one on which we should like to hear from practical planters.

PROGRESS IN B. C. AFRICA.

A RAILWAY TO BLANTYRE SANCTIONED.

(*From Our Planting Correspondent.*)

Mlanji, B.C. Africa, 22nd Aug., 1901.

A telegram was received last week by the Manager of Sharrer's Zambezi Traffic Company that the Foreign Office had granted the necessary concession for the construction of a railway from Chiromo to Blantyre; but no further information has been received to date. Sharrer's Z. T. Company have been pressing the home Government for 3 per cent. guarantee on the capital required for the construction of our railway for some years and it has doubtless been granted. For some years back it has been known that Mr. Sharrer had the promise of the capital to build our railway, provided 3 per cent. guarantee was given by Government.

Lord Stanmore, formerly Sir Arthur Gordon, Governor of Ceylon, is one of the Directors, and has been using his best efforts for years back with the home Government to secure our much-needed line. Great credit is due to Mr Sharrer, the Managing Director of this enterprising company, for sending out a Mono-Railway to relieve the human traffic on the road from the lower Shire to Blantyre. It is now being laid down from Katnugns to Blantyre. An attempt was made to lay this line from Chiromo or Maqueras some miles further up the river to Blantyre, but it was found that the gradients were too steep and now there will be no need for it on the Chiromo-Blantyre route. The gauge of our line is likely to be 3 ft. 6 in., the same as in all the South African Railways.

The opening up of the country from Chiromo to Blantyre should do much good, leaving out of the question the capital to be spent and the labour set free for agriculture. H. B.

RUBBER FROM YOUNG "FICUS ELASTICA" TREES.

In recent proceedings of the Selangor Planters' Association, we read :—

Letter, dated 20th June, 1901, from Mr. Derry, Government Plantation Office, Perak, to the Hon Secretary, Selangor Planters' Association, enclosing copy valuation of sample of rubber sent some time ago by Mr. Tan Chay Yan, of Malacca, from Ficus elastica trees four years old. The following is the valuation made by Messrs. W. J. and H. Thompson:—"This is a good rubber and well prepared The value is about 3/- per pound, provided the bulk is fully equal to the small sample (one kati), equally clean and equally dry."

IMPERIAL RUBBER.

It is stated that the present annual consumption of rubber all over the world is about 54,000 tons, with a production of only 54,600, so that the margin between consumption and production is extremely small, and may easily vanish altogether in a year or two, says a contemporary. In looking through the list of countries which supply the world with rubber, it is rather annoying to note that Imperial Britain takes a very small share in the trade: a share which could surely be greatly increased, were attention and capital to be drawn to the industry. It is one of these occupation wherein a brisk market at high prices is a matter of practical certainty, and hence the risk of sinking capital is reduced to a minimum. We have many colonies where rubber could be grown ; and especialy is the colony of Queensland suited for the business. In many parts of that great country conditions exist similar to those in Brazil, Peru, and Bolivia, from which countries at present half the world's supply of rubber is drawn. The value of the material produced by these South American States cannot be far short of £8,000,000 sterling per annum—a sum sufficiently tempting to induce the employment of capital on a large scale. We have yet hopes of seeing a big Queensland rubber trade established which shall rival the Brazil and Peru in quantity and quality of exports.—*India-rubber Trades' Journal.*

TEA INSPECTION AT THE PORTS.

Reduction of duty.

Sir,—There are two circumstances affecting the tea trade at the present time which demand attention. The first is the excessive duty, for it is against all the traditions of the country that the most wholesome of non alcoholic stimulants, which has become the staple beverage of the masses, should bear a tax 30 per cent over the cost of production, while a tax representing only one-third of the same ratio is raised on beer. That the temperance party has not taken this up is a matter of surprise. The second circumstance which equally calls for attention is the necessity of preventing the importation of really bad and unsound teas.

These two questions are inter-related, and should be taken up as parts of one scheme of reform, for it will be useless to reduce the duty if the result is only to flood the country with bad tea, and so prejudice, instead of stimulating, consumption. The year 1900 gave a good sample of what some producers can do in that respect, and that a stop must be put to the practice is proved by the admissions of the planters' own newspapers, which would have been very prejudicial to the sale of tea had they been read in this country. It is also becoming daily more necessary to disarm the medical opposition to the use of tea, which is justifiable only if confined to badly manufactured teas, none of which need be passed by the Customs.

One fact no generally known about tea is that it is the only commodity of universal consumption the supply of which can be indefinitely increased at a few weeks' notice by the action of a few large companies. We cannot instantly increase the supply of coffee or cocoa, because these are fruits. Even a grain crop requires new cultivation, and a full year must elapse before much increase can occur. It is not so with tea. The same bush can at a fortnight's notice be made to increase its production 30 per cent by "coarser plucking." Nor does the evil merely end in glutting the market and so injuring the stability of the industry. In coffee, cocoa, or wheat the article—whether it be a bean or grain—remains the same in quality; but in tea simultaneously with this sudden increase of the supply the quality is deteriorated and the consumption—a very serious matter alike to the consumer and the distributor—is prejudiced. If these are facts they must be met by any remedy that may be practicable and within the limits of fair legislation.

The Food and Drugs Act is provided by the nation in this spirit, but is inoperative in tea, because it deals with teas after they have passed through the "blending process," instead of detecting the bad constituents before they have left the Custom House. No grocer wants "rubbish teas," but if tea, however bad, may be offered without restriction at public sale—which is the delightfully permissive state of the law at present—there will always be people to buy it and pass it on, flavoured with something else, to the grocer.

It is this, specially bad tea, which will not keep that ought to be put under the ban of the Customs, specially in view of the extortionate duty levied. Now I am no supporter of the principle fo Government interference, such as might be attempted on the unfortunate retailer through the Food and Drugs Act, but I do believe in prevention being better than cure, and can show that prevention in this instance is the more easily applied. All that the Government need do is to appoint a few trade tea experts—the only people who have an instinctive knowledge of tea—to detect the really noxious teas. These men, as inspectors, should have the necessary authority to draw samples at will, as the shipments are landed, from the teas indicated by the brokers' published sale-lists to be under suspicion.

It would mean sampling but a very small percentage of the supplies, but the mere risk of a mark being condemned would deter unscrupulous producers from taking the risk of plucking for quantity regardless of their ability to convert that quantity to wholesome tea.

If it is said that this form of Government interference is objectionable it may be replied that the Government do employ inspectors as it is, but they merely examine the dry leaf—a test which is practically useless, and may just as likely stop good tea as bad. This actually did occur a few months ago, a mark of a well-known Ceylon estate having been condemned by the Customs on its appearance, but proved on analysis to be of excellent quality. Yet the Customs authorities who had condemned this were passing millions of pounds of offensive teas. From amongst them a set of samples was obtained in the ordinary trade way for the purpose of the pamphlet, "The Tea We Drink," recently noticed in your columns. These samples proved to be of a very objectionable description. They can be produced and verified, and they represent estates owned by some of the first tea companies in India and Ceylon.

Obviously, then, a change of the system of inspection from a mere ocular examination of the dry leaf to an infusion test by experts is necessary if the public and distributor are to be protected. There is no necessity that the test, in the first instance should be an analytical one, but only that the analyst should report on what the trade expert has condemned. By this means much assistance might be rendered to the planter in avoiding faults of manufacture. If it is said that now is not the time to introduce the reform because little bad tea is coming in the reply is that it is of all others the very best time on that account. If it had been introduced last November, when much bad tea was coming in, it would have created a great deal of trouble.

Now the person who should lead the way in pressing for these reforms, viz., the reduction of the tea duty and the stoppage of really bad tea, is the grocer. In doing this he will be fighting both the people's battle and his own for it is, to start with, a trade question requiring some technical knowledge. The public do not possess this, but will support what is in their interest if pressed for by the grocer.

I am, &c., E. H. SKRINE.

5, Victoria avenue, Bishopsgate-street, E. C., July 30.—*Grocer*. Aug. 3.

FRUIT CULTURE IN JAPAN.

(*To the Editor*, "*North-China Daily News.*")

Sir,—The subject of fruit culture has always been of interest to me, and when I first came out to the East in 1863 we always used to wonder why it was that the Japanese insisted upon gathering their fruit before ripe and that even then you could hardly ever get a peach that had not a grub in it. I thought I would try for myself, and got a collection of peach and pear trees out from England. I also got some of your excellent peach trees from Shanghai.

Under my care, for a variety of reasons, chiefly that I had not room, they never really succeeded. I gave the plants away in various directions, and now in the country hereabout, partly thanks to these trees, the cultivation has increased and is rapidly increasing.

It is found that a light, sandy soil, especially where it is well watered by a river, is best suited for fruit culture and some of our peaches are really splendid; whilst among the pears I have seen fruit of a size that I never saw in France or England. But my object is chiefly to tell you how the Japanese have managed to get good crops of peaches with no grubs in them, for in talking with an old Shanghai resident the other day, he told me you were still unable to secure a crop of peaches free from this pest. The Japanese select the peaches they wish to keep on a tree, and when the fruit is the size of a walnut they cover it with a paper bag made from the ordinary cheap Japanese paper, which has been steeped in what is called here "Shibui," a preparation of the juice of the persimmon tree. This has a peculiar acrid odour that insects will not approach. The bag is virtually air-tight, and the throat is fastened by a string round the branch to which the

fruit hangs. The special grub against which you take these precautions is the produce of a fly which is generally seen about the month of April. It lays its eggs one by one on the young fruit generally close to the stem. There the egg sticks for some weeks, until just about the period when the fruit commences to swell and take its sugar ; then it hatches and the first object in life of the young grub is to bore its way into the fruit where it proposes to live. Prevent the fly from laying its eggs on your fruit and you save it. It is not very material if you leave the bags on or take them off when the fruit has increased in size. If you have provided by making the bags large enough, the fruit will generally ripen inside and it has one advantage : if your fruit falls when ripe, it will fall into your bag and not get bruised but on the whole if you have the time and can give the necessary attention you should take the bag off about June, for the flies are no longer to be dreaded then and the fruit will generally be better for having ripened in the sun.—I am, etc ,

R D ROBISON.

Yokohama, 9th Sept.—*N China Herald*, Sept. 18.

THE ROMANCE OF TEA.

The cold reality of a grocer's price-list would suggest to few of those who read it any poetical or romantic associations, and yet the part of it which relates to tea is full of veiled poetry. Most of us leave it to our wives or housekeepers to select the brand they prefer, ladies being commonly supposed to take more interest in the cup that cheers than the sterner and more alcoholic sex. But in these days of Temperance men are beginning to lose their former shame at being discovered "in their tea cups," and it is well that they should understand a little of what the names in the grocer's list are meant to tell them. Not that worthy tradesman intends to tell them any thing by the names he uses, for he is quite ignorant of their real meaning. Nevertheless, these names were not given by the Chinese without a reason, and they are the more worthy of notice because in spite of the talk of adulteration in connection with Chinese teas, the fact remains that tea is one of the very few things that fires the enthusiasm of the Chinese mind, and leads the growers of that pretty camellia-like plant to take a pride in its quality apart from more cash considerations. Let us deal first with some of the uncouth names to be found in our aforesaid grocer's list. Hyson will probably be found to figure among them. This is a corruption of two Chinese words, one of which signifies "before the rains ;" while the other Hi-chun is the name of a young girl, which, being translated, signifies Flourishing Spring. About two hundred years ago this girl suggested to her father an improved method of sorting his tea. He adopted it, much to his advantage, and his tea having become famous, he gratefully called it after his daughter. To this day members of the same family are selling this same tea, and the "chop," or brand, of this particular kind of Hyson is Li Ya-hing, *i e.*, Li's Extra Perfume. But this is a name which we must not look for in the grocer's list until the public knowledge of tea and its various qualities becomes very much greater than it is at present. Oolong is a name we may look for with more confidence. This word means Black Dragon, owing to the fact that one Su was the first to bring to notice the peculiar excellence of a tea plant in which he had discovered a black snake coiled up. Congon is a name commonly applied in this country to tea suitable for breakfast. It simply means "well-worked." Applied to Ceylon tea it used to mean tea made from the lower and coarser leaves of the plant as opposed to the Golden Tips, which sufficiently indicate the young buds growing higher on the main stem. This Golden Tip tea is mostly allotted to the Court and to high Chinese officials. The writer was once favoured with a cup

OF A VERY SPECIAL BRAND

of the Ceylon variety. After first being handed round to be inspected and admired in its dry form, it was infused with the aid of a sand glass, and then poured off to be drunk, it is needless to say, with no allaying mill. Comet Port could not have been produced with more ceremony, and the feeling of respectful awe with which the golden beverage was imbibed has survived the memory of its exquisite flavour.

It is not perhaps generally known that the flower petals of roses, olea fragrans tuberose, orange, jessmine, gardenia, and azalea are largely used to perfume the teas we drink though the name Orange Pekoe might, perhaps, have suggested this fact. The Chinese call this tea by a name meaning superior perfume, while the pure Pekoe is called Lau-tsze's eyebrows. It should be explained that Pekoe means "white hair," and is applied to the young tea leaves owing to the fact that they are covered with a fine white down. Most of this tea is sent to this country or Russia, where it constitutes the bulk of the famous caravan tea sent overland. Lanteze was the founder of the Taoist religion, but as he was born about a thousand years before the earliest mention of tea, we may presume he never realised the virtue of his own eyebrows as a beverage. Other interesting Chinese names are "Carnation Hair," "Red-Plum-blossom," "Lotous Kernel," "Sparrow's Tongue," "Dragon's Pellet," "Dragon's" Whiskers," "Autumn Dew" and "Pearl Flower." The name Souchong simply refers to the mode of packing the tea. It is odd that the grocer should have fastened on this word for the purposes of his list. Ceylon growers however, used to apply it to the leaves growing above the so called Congou leaves. Gunpowder tea, it needs scarcely be remarked, is an English term which, though the Chinese are sometimes said to have invented the explosive, they have never thought of applying to the tea themselves. So is "Imperial tea ;" the Chinese call this variously "Sore Crabs' Eyes." "Sesamum Seeds," or "Pearls" To remove the bad impression which it is feared the name Sore Crabs' Eyes may have produced, it should be added that the vast majority of Chinese names for various kinds of tea are very picturesque, as, for instance, Hearts of the Water Lily, Hearts of the Nine Curves, Eyebrows of Esteemed Old Age, Palm of the Gods, Tea of the Princess Peak, Tea of the Clouds and Mists of Mount Mung, Tea of the Dragon's Well, Spikes of Silver, and Interwoven Branches. There is

A CHARMING CHINESE BALLAD

which the tea-pickers sing as they gather the leaves. It describes the hardships undergone by the girls who do this work, and makes mention both on the Sparrow's Tongue and Dragon Pellet kinds incidentally. One of the stanzas runs as follows :—

"My face is dirty ; out of trim my hair is, and away;
Oh, tell me, where's the little girl so ugly now as I ?
'Tis all because whole weary hours I'm forced to pick the tea,

And driving winds and soaking showers have made me what you see."

After alluding to the fact that early hours and hard work have made her thin, the singer continues:—

"But if my face be somewhat lank, more firm shall be my mind;
I'll fire my tea that all else shall be my golden buds behind;
But yet the thought arises who the pretty maid shall be
To put the leaves in a jewelled cup, from which to sip my tea.
"Her griefs all flee as she makes her tea and she is glad; but oh!
Where shall she learn the toils of us who labour for her so?
And shall she know of the winds that blow, and the rains that pour their wrath,
And drench and soak us through and through, as plunged into a bath?

The Chinese, it may be mentioned, dread rain. The pathos of the situation described by the little bedraggled girl in the ballad will, therefore, be duly appreciated.

Naturally, the Chinese think very highly of their national beverage. It is not, perhaps, generally known that no less a person than one of the Chinese Emperors has laid down instructions for the proper infusion of it. You are to take, he says, clear spring water, and heat it to the extent that would be sufficient to turn a clay fish red. You pour this on the leaves and forthwith drink it. Whether these directions are generally observed in China we are not aware. The native made tea that one gets in the Far East generally seems slightly insipid until the palate has grown used to its delicate gradations of flavour. Stewing and the abominable habit of "cosying" are, of course, unknown; though in Thibet tea of a coarse quality is literally made into soup with milk and butter vinegar, and pepper being added when procurable. Other things are sometimes mixed with it by the poor, as will be seen from the following notice of tea, by a Chinese expert, written nearly three centuries ago:—"Tea is of a cooling nature, and if drunk too freely will produce exhaustion and lassitude. Country people before drinking it add ginger and salt to counteract this cooling property. It is an exceedingly useful plant; cultivate it, and the benefit will be widely spread; drink it, and the animal spirits will be lively and clear. The chief rulers, lords and great men esteem it; the lower people, the poor and beggarly will not be destitute of it; all use it daily and like it." And it is because this is still true that the Chinese are one of the most temperate and sober peoples in the world.—*Evening Standard.*

CEYLON TEA ON THE CONTINENT.

We make the following extracts from a letter from Mr. J H Renton, dated "Bückeburg, Germany, 11th Sept., 1901":—

I am sending you by this mail a little

PAMPHLET IN GERMAN

which gives a short, but clear account of the rise of the Tea Industry in Ceylon, the culture of the tea bush, and the manufacture. This is known in Germany as the defence pamphlet ("Abwehr Brochüre"). It was written as a reply to the numerous libels on Ceylon tea which appeared in numerous Continental market reports in the early part of this year. It does not enter into any controversial points, nor does it attack China tea. It simply shows our teas are clean, well-made teas and that our cultivation is good and sound. This pamphlet has been distributed to every wholesale tea dealer, most of the wholesale colonial produce dealers, 3,000 newspapers and 1,000 hotels in Germany. The demands for more copies are numerous and the notices which have been received are very flattering.

Well, now to give a very brief summary of what I have done this year:—

I visited Western and Southern Germany, Austria, Bohemia, Hungary and Trieste, Northern Italy, Southern and Western France and Paris in the first four months of this year. In May I went to Hamburg, Berlin, Leipsig, Dresden, Magdeburg and I have now been round the Baltic and Eastern Germany, going as far north as Konigsberg. These visits have not only been made to thoroughly acquaint myself with the tea trade in these places, but also with a view to preach Ceylon tea to the dealer and the grocer, leaving as I do copies of your book and of Bamber's pamphlet. Apart from those visits I have been carrying on the campaign in Switzerland and Scandinavia by correspondence.

IN GERMANY,

a Bremen importer furnished me with the names of all the wholesale dealers in the inland towns, and although several of them have been induced to give small orders for Ceylon tea, only three of his friends have been found willing to take it up, make a speciality of it, and put *their own money* into the pushing of it. These three firms are in Breslau, Strassburg and Holstein. A special circular (I sent you one in the book marked Talanda tea) has been printed for these firms. The circular is illustrated and they bear two-thirds of the cost. The same firm in Bremen has also induced (K—— Co.) the great coffee distributing firm, with their 780 shops throughout Germany, to take up Ceylon tea. They get 500,000 circulars and a special mark and label. They bear half the cost of all this expenditure. Their campaign does not open till November as the teas are all put up in ¼-lb. and ½-lb. packets. If properly managed and run, we want no better agencies in Germany. In addition to these firms I have secured other wholesale dealers who are making a speciality of Ceylon tea—one important firm in Frankfort, a smaller one in Berlin, another beside Böhringer in Stuttgart. Böhringer is doing excellent work in Stuttgart. In Dresden and Konigsberg there are two firms who use it largely in their mixtures, but will not advertise it, because they maintain that, owing mainly to ——'s association with Ceylon, and the poor teas he has put on the German market, the name Ceylon has got into bad repute for tea. In Münich a lady, ——'s sister, carries on an active propaganda for pure Ceylon tea.

IN AUSTRIA.

Mr. Marinitsch has done well in Karlsbad and got the gold medal at the Exhibition. We have three agencies in Vienna. A dealer in specialities, who has for years imported it direct and sold small quantities, is now getting aid to advertise it. Mr. Marinitsch has

associated with himself a wholesale coffee dealer with a connection amongst town and country grocers and is working hard, not with much success though, Toifl the client of the Bremen importer, is doing better. He promised me to place the tea with 500 of his clients throughout the Austrian provinces. He has got 350 up to date, he has to pack the tea in 1-16th lb., ⅛ lb. and ¼ lb. packets for them; and then the Anglo-Continental Company of Paris are working from Trieste, so is also another house in Trieste.

IN FRANCE.

We have three Paris houses, and in Marseilles two smaller firms at work. The Paris firms are working hard; one has specially distinguished itself by its enterprise in starting the big new tea rooms in the Rue Caumartin, by its display at the Exhibition in the Petit Palais this year, and at the Exhibition Culinaire, and by its handbill posters, bills and general advertising. Another has done very well in various advertising schemes; but more particularly by taking up at my express with a demonstration scheme. A man is going round the Provinces, and in all the big towns where he can get the grocers to buy the tea, he gives a demonstration of from four to ten days. It is advertised in the local press that free teas will be distributed in cup at that grocer's shop from 4 to 7 o'clock. Samples of the tea are given away free—and lots of literatures on how to make it etc., and Bamber's book, in French. Here is a resumé of the work done in June and July in Normandy:—Six towns visited. Tea distributed in cup on 28 days. 4,425 cups tea served; tea sold to the public 2,055 people: advertised in 11 local papers; tea sold, 650 kilos. New grocers secured, 24. Printed matter distributed, 41,500. Placards posted in and on windows of shops, 110. Both these firms are spending far more than three times my grant on their work this year.

IN SWITZERLAND

we have four firms at work, in Sweden two, in Christiania two, in Copenhagen two.

IN ITALY

in Naples one, in Florence one. The arrangements I made in Genoa have fallen through, unfortunately.

I go to

SCANDINAVIA

tomorrow to inspect the work there and on my return start immediately for Frankfort and Stuttgart. In the latter town a client of Bôhringer's opens a tea room on 1st October. From Stuttgart I proceed to Switzerland to inspect work and accounts and then to France. I shall go to all the towns in France where the demonstrator has been, to see personally how the work agrees with his report. In Paris I inspect accounts and talk over schemes for next year.

I then go to London to see the British Commissioner for the

ST. PETERSBURG EXHIBITION

and obtain letters of introduction from our Foreign Office to the British Embassy there. End of November I shall probably go to St. Petersburg to inspect the land and make the necessary arrangements for our show in the autumn of 1902. From Germany, Austria, and France I receive *half-yearly reports* and an abstract of accounts and expenditure. All vouchers in these three countries are examined and compared with the accounts in my visit in each town. From Scandinavia and Switzerland the vouchers are sent to me and then returned. I keep a most watchful eye on all expenditure and I feel quite certain the Committee get full value for their money. In Germany I know I could get an agent in each large town to run, push and advertise Ceylon tea; *but* then I should have to bear *all* the expense. The difficulty is to get them to put their hand into their own pockets and bear even half the expenditure.

PEARLS IN THE PHILIPPINES.

Colonel Clarence R. Edwards, chief of insular division, War Department, is preparing a Gazetteer of the Philippine Islands which will contain much valuable information from official and other sources. He has just completed a comprehensive account of the pearl and shell fisheries of the Sulu archipelago. During the year 1899 the value of shells, not sawed, cut, polished or otherwise manufactured, imported in to the United States for home consumption was $969,349, and in 1900 $1,016,728. The manufactures of shells, mother-of pearl, etc., are now almost entirely confined to the United States. In the years above mentioned but $82,610 40 and $88,362 32 respectively of shell and mother-of pearl manufactures of all kinds were entered for consumption. In regard to pearls, the best English expert says that the Sulu archipelago produces the finest round pearls in the world. The known pearling area in the Sulu and Celebes seas possessions of the United States is 15,220 square miles. More than double that area possesses the physical conditions necessary to the best form of pearl oyster life and the nacreous shell which contains it. Siassi, in the Tapul group of the Sulu archipelago, is the strategic centre of the most active pearling industry in United States territory, and should be made the station. There are a number of fishing villages and several thousand fishers in the vicinity. The value of pearls, in their natural state or split, imported into the United States for home consumption during nine months ending March 31st 1901 was $1,086 480, ranking next in value to diamonds.—*Straits Times*, Sept. 23.

PLANTING IN PERAK.

COCONUTS—COFFEE—RUBBER—TAPIOCA—GUTTA.

COCONUTS.—Next to the cultivation of sugar that of coconuts at present finds most favour with planters. Where the soil is suitable, either coconuts or para rubber, and sometimes both, are being planted between the rows of coffee on the estates hitherto devoted to coffee alone. Applications covering many acres have been received, more especially in the district of Lower Perak, between the Perak and Bernam rivers, where an extraordinary energy has been displayed. Here 318 applications have been received from natives, chiefly foreign Malays, for small holdings to be devoted to this form of cultivation. In the same part of the districts the Straits Plantation Company has planted up between three and four hundred acres of the two thousand owned. The Government is devoting special attention to opening this country by roads and bridle-paths, I

recently visited this part of the State and was struck by the richness of the soil as evinced by the extraordinary growth and strength of the coconuts, many of which were in bearing at four years old.

COFFEE.—The prospects of coffee have shewn but little signs of improvement during the year. On the estates that have been maintained in good order the crops have been good, but the present price of coffee, it is feared, prevents its being cultivated with success except in connection with other products such as rubber or coconuts.

RUBBER.—Para rubber is now extensively planted on many estates. Where well tended it grows well and the young trees are strong and healthy. In many places, however, white ants, which attack the roots of the trees, are a dangerous enemy, and one against which the planter will have to guard. On no estate have the trees arrived at sufficient maturity to enable them to be tapped.

TAPIOCA.—Go Hooi Chew's tapioca estate at Temerloh is well reported on. It is kept in excellent order and coconuts, durians and other valuable trees are planted throughout it at regular intervals, a tram line runs through the estate connecting the outlying fields with the mill.—Mr H C Hill, the Conservator of Forests, I.F.S. is of opinion that the State has an ample area of

GUTTA PERCHA-PRODUCING FOREST—and that no recourse is necessary to the establishment of special plantations outside the limits of its natural growth. A working plan is advocated whereby the *palaquium* forests be divided into a number of areas, which should come under operation at regular intervals of five to ten years; the operation would consist in giving more light and space to each *palaquium* tree, and in transplanting seedlings to blank spaces.

KUALA KANGSAR GARDENS.—The result of a sale in London market of a parcel of Para Rubber *(Hevea braziliensis)*, was received early in the year. 327 pounds of the best quality rubber fetched 3s 10d per pound, and twenty three pounds of scraps, *i.e.*, the fragments of rubber picked off the stems of the trees after tapping, were sold at the rate of 2s 6d per pound. Eighty two trees, of an average age of fourteen years, were tapped to give this result; the yield is thus a little over four pounds to the tree, but the Superintendent, Mr Derry, reports that exceptionally heavy rains frequently interrupted the work and threatened in conjuction with the tapping, to damage the seed crop, and that therefor the tapping was stopped in many cases long before the supply of latex was exhausted. From the eleven best trees over ninety seven pounds of dry rubberwere obtained, one tree yielding twelve pounds and one and half ounces. A small sample of Gutta Rambong *(Ficus elastica)* was reported on in England as "good clean Java character," and sold at the rate of 3s 10d per pound. A tree in the Kuala Kangsar garden yielded twenty five pounds at a single tapping; this nineteen years old, and about ninety feet high, measured round the aerial roots at three feet from the ground, it has a girth of eighty eight feet. Mr Derry's report on the preparation of the rubber for the maket is most interesting, and a copy of it will be supplied to the Managers of the Plantations in the State.—*Perak Administration Report.*

KING LEOPOLD, RUBBER MERCHANT.

The interest of the king of the Belgians in Congo rubber is mentioned so often, in his own country as well as elsewhere, that it must amount to something. In fact so far as the Congo Free state is Belgian at all, it may be considered as King Leopold's private property. The value of the rubber resources in the Congo was no sooner appreciated than a "private domain" was established, within which rubber gathering without official permission was prohibited. It happened that the richest rubber forests were included in the reserved district. Every steamer from the Congo which arrives at Antwerp with rubber includes on its manifest a liberal shipment on account of the "Domaine prive"—in other words state rubber. But this is not all. Some time ago. *The Speaker*, an English journal, published an article pointing out that several of the supposedly private companies in the Congo rubber trade were in reality permitted to operate there only on condition that the state—practically the king—should be admitted as a shareholder, in most cases to the extent of 50 per cent. of the capital. The amount of rubber coming from that country from really private companies, therefore, is comparatively small. Taking the reports of Congo rubber arrived at Antwerp during the first half of 1901, as published in detail each month in the *India Rubber World*, the figures permit of the following analysis, in the light of the article published in the English paper:—

	Kilograms.
Domaine privé Etat du Congo ..	1,592,101
Companies in which the state is interested ..	614,087
All other companies ..	761,831
Total ...	2,968,019

While these figures may be subject to revision, the salient fact remains that the rubber output is largely in the hands of the government. And if half the reports be true, the rubber collectors who work for the government agents do not receive such high wages, but that a very comfortable profit exists, at the prices commanded by Congo rubber at Antwerp for several years past. King Leopold may fairly be recognized, therefore, as one of the greatest of rubber merchants. And he can afford to laugh at competition.—*India Rubber World.*

MATÉ LEAVES.

Cador, in an interesting paper on this subject (*Jour. de Pharm. et de Chim.* 1901, ii. 162) points out that various observers have established the fact that not only the leaves of *Ilex paraguaiensis*, but also leaves of other species and even plants not belonging to this genus, go to make up to what is known as maté. Cador has examined twenty-five species histologically in order to determine differences in the structure of the leaves, and also the relative amounts of caffeine in the various portions of the leaf. Nineteen of the species belonged to the genus *Ilex*, two were of *Villarezia*, and four were of *Symplocos*. All these plants grow in South America, in the basin of the Rio de la Plata and its tributaries, in the basin of the Rio Uruguay, and in those of the Rio Paraguay, and the Rio Parana. All the ilex leaves have a bifacial structure. The upper epidermis is usually a single layer, is doubled in *Ilex affinis*, and partially doubled in certain varieties of *I. Theezans*. The cells of the mesophyll enclose corpuscles of a fatty nature and crystals of oxalate of calcium. Numerous peculiarities are noted in certain species, which enable one to differentiate between many of them. Such, for example, are cuticular striations on the lower epidermis, and spherocrystals of hesperidine found in certain parts of the leaves. In the two species *Villarezia* which are utilised, the cells of the lower epidermis are characterised by very thick walls, and in *V. Conghonga* very large isolated crystals are observed. Species of *Symplocos* are distinguished by the brownish

green contents of the cells of the upper epidermis, and by the disposition of the cells annexed to the respiratory apparatus These are so placed as to have their long axis parallel to the ostiole. Of the various reagents suggested for the histologico chemial examination of maté, Cador prefers concentrated hydrochloric acid and a three-per-cent solution of gold chloride. By means of these re-agents well-defined groups of crystals of the double chloride of gold and caffeine are obtained. The reaction is particularly marked in the case of *Ilex paraguaiensis* — *Chemist and Druggist*, August 31.

PEARL OYSTERS.

Mr. Lyster-Jameson, B.A. Ph. D., sent us by a recent mail a copy of his paper :- "On the identity and distribution of the Mother-of-Pearl Oysters : with a revision of the Sub-genus Margaritifera"—reprinted from the proceedings of the Zoological Society of London, April 16th, 1901. This instructive paper, of some 23 pages, opens :—

" Acting upon a suggestion made to me by Professor E Ray Lankester, I have recently been engaged in rearranging the collection of *Margaritiferæ* in the British Museum of Natural History, and in revising and extending the series illustrating the commercial forms. The nomenclature of these forms has hitherto been in a chaotic state, and it has occurred to me that this revision of the genus may be worth publication if only to prevent further confusion of the common commercial forms by zoological and economic writers." Can Mr. Lyster-Jameson be coming out with Professor Herdman to Ceylon, Professor E. R. Lankester having been originally consulted by the Colonial Office? The passage of special interest to us in Ceylon, in the paper is the one we quote below :—

MOTHER OF PEARL OYSTERS.

(From paper by H. Lyster Jameson, B. A., PH. D.)

Species 13. MAGARITIFERA VULGARIS.

Perlamater vulgaris Schumacher, 1817 p. 108, pl. xx. fig 8 ; no loc.

Chemnitz, 1785, tab 80. fig. 717 (referred to by Schumacher as a second figure of his *P vulgaris*).

Avicula fucata, Gould, 1850, p. 309 1852. p. 441, pl. 39. fig. 551 ; New Zealand

Avicula fucata, Reeve, 1857, sp. 74 ; Japan. Type in B M.

Avicula occa, Reeve, 1857, sp. 24 ; Red Sea. Type in B M.

Avicula aerata, Reeve, 8157, sp. 32 ; Australia. Type in B M.

Avicula perviridis Reeve, 1857, sp. 20 ; Australia Type in B M.

Avicula (Meleagrina) varia, Dunker, 1872, p. 17, tab. 4. fig. 6 ; Red Sea.

Avicula (Meleagrina) badia, Dunker, 1852, p. 79 ; 1872 p. 12 tab. 2 fig. 7 ; no loc,

Savigny, 1811, pl. 11 figs. 8 & 9.

As Schumacher's figure, and the one by Chemnitz to which he refers, are evidently typical Eastern Lingah shells (from convexity, posterior "auricle" of hinge-line, sharp separation of the inner surface of the rostrum from the general surface or the nacre by a well-defined ridge, and distinct anterior and lateral teeth in Schumacher's figure), the name *vulgaris* must replace the more familiar *fucata* (Gould) for this species.

This shell is extremely variable, and young examples have been described as distinct species over and over again, while, until comparatively recently. the grown shell has been confused by many writers with *M margaritifera*.

It is highly probable that some of the described forms which I am still treating as separate species will, on better acquaintance, prove to be merely geographical races of *M vulgaris* Schumacher.

Geographical Distribution and Variation ;—

Ceylon and Southern India. The Ceylon Pearl-Oyster is the best known local form of this species. It frequents the Gulf of Manaar, Palk Straits, and the Southern coast of India. It differs from most other local races in its lighter colour, and the whitish or pink ground-colour of the interior of the lip.

Maldive Islands. Mr J Stanley Gardiner, on his recent visit to the Maldives, found this species fairly plentiful there, but not in extensive beds. Unlike *M. margaritifera*, this shell is not fished by the natives of the Maldives. Mr Gardiner's specimens closely resembles those from Ceylon, and were at once referred by Captain Donnan to the same species.

Persian Gulf. The Lingah shell of the Persian Gulf belongs to this species. It is distinguishable from the Ceylon form by its darker colour, the exterior being usually more purple and the radial markings almost black. The interior of the lip is dark red. The shells attains somewhat larger dimensions than in Ceylon waters. It is shipped in quantities to the London markets, but is of small and fluctuating value, owing to large supply and limited demand.

Red Sea. Throughout the Red Sea this shell is common, but is fished almost exclusively for pearls. There are a number of specimens from the Red Sea in the British Museum, but with one exception (Aden, Major Verbnry) they are very young. The Aden specimen is very like a Ceylon shell.

[*Mediterranean.* Since the opening of the Suez Canal this species has wandered into the Mediterranean. There are typical examples from Alexandria (W B Tegetmeier) and Malta (Col. Feilden) in the British Museum. An account of this interesting immigration has been published by Vassel, 1896.]

East Africa. Specimens from Mauritius (B M ; Mus. Cuming), S. Africa B M ; J. H Ponsonby Coll.), Bazaruto Isl. (do.), and Durban (do.), although differing slightly from normal Lingahs in form and markings, are probably merely a local race of this very valuable species. I do not feel disposed to describe them even as a geographical variety on the small amount of materiaal available.

Malay Peninsula and Archipelago. Specimens from Malacca and Singapore in the Brit. Mus. are hardly different from Ceylon examples. I have found typical examples associated with the young of *M margaritifera* in a trade sample from Flores.

Australian Waters. " The Australian Lingah" shell of the London markets, most of which comes, I believe, from West Australia. and the " Bastard Shell" of Torres Straits (Pace, 1898) are preferable to this species. There are immature examples of *M vulgaris* from various localities on the North coasts of Australia in the British Museum. Two specimens from Sydney, presented by the Earl of Derby, are the most southerly record. On the West coast it occurs as far south as Sharks Bay (Saville Kent). Australian Lingahs closely resemble those from the Persian Gulf in colour,

New Guinea. The Pearl Shell of the Trobriand Island, which is fished almost exclusively for its pearls, belongs to this species. The fishing is carried on entirely by the natives, in 0 2 fms., and the live shells are purchased in bulk by the traders. They yield quantities of pearls mostly of inferior value. The shell has been exported and sold as Lingah in small quantities. The external colour of the Trobriand shell is as in the Persian Gulf form, but the nacre is more smoky and leaden in lustre. I have occasionally found isolated examples in other localities in Eastern New Guinea.

New Zealand Gould (*M fucata*).

Japan. Reeve (*M fucata*) (locality doubtful).

A 1,500 YEAR-OLD TURTLE.

The largest turtle in the world rejoices in the appropriate name of Jumbo. He weighs a trifling 500 lb., and is credited with having celebrated a modest 1,500 birthdays. He was brought to San Francisco from the Galapagos Islands last year, and had to be carried by his proud, but exhausted, captors over no fewer than eighteen miles of the lava beds which characterise certain parts of these islands. "Jumbo" is over 5 ft. in length and is a valuable property. It is estimated that he is likely to live 500 years longer, and he is valued at nearly £1,000. He seems none the worse for his cruise or change of air. If "Jumbo" should live out his allotted number of years there is no knowing what disposition will eventually be made of him—*Daily Express*, Sept. 12

PRODUCE. PLANTING, AND COMMERCIAL NOTES.

Commenting on the table published by Mr George Seton, giving results of Indian tea companies during the season 1900, the "Financial Times" says: "It will be observed that despite an increase in the output of tea amounting to nearly 10 per cent.' the profit per lb has fallen to nearly one-half of what it was last year, the working cost being little under that of 1899. There is, however, one encouraging feature. Over-production is admittedly the root of the evil, and it is therefore gratifying to find that notwithstanding the failure of the scheme to effect a combined reduction in the output, there is evidently a disposition on the part of the companies to follow out this principle individually. A glance at the figures representing the acreage shows that the increase in the area planted is only a little over 1 per cent. This can only be regarded as a very moderate proportion to meet the depreciation in the gardens, and goes to show that the different managements have fully realised the folly of large extensions. As to the outlook for the current season, it is as yet too early to express any reliable opinion. We are informed that in all districts, with a few exceptions, there was a considerable shortage in the tea crop at the end of August, owing, to a large extent, to the weather, which curtailed the pickings, and this being the case it is certain that unless this falling-off is made up by the end of September the crop will be materially reduced. It must not be overlooked, however, that there was a large surplus from the past season at the end of May, and the question is as to what stocks are held in private hands. The opinion expressed by an authority is that it is now but small, and in that event, if there should be, as is not unlikely, a shortage in the current crop, it is not improbable that we shall see better prices at Mincing Lane before very long. This view is corroborated by Messrs. Gow, Wilson and Stanton in their weekly report, issued yesterday, but, at the same time, they emphasise the warning that as young tea from the recent extensions of tea plantations in India is now coming into bearing, every effort will be required on the part of planters to reduce the output. In the meantime it is interesting to note that the direct export of Indian tea to places outside the United Kingdom for the first half of the year was largely increased, no fewer than 5,774,600 lb having been shipped, as compared with 3,344,200 lb in the corresponding period."

A writer in the "Trade Press List," published at Boston, U.S.A., seems more scornful than hopeful on the subject of tea-growing in the Southern States. He says: "For over a hundred years different individuals have used the United States Agricultural Department as a nursing bottle to draw funds from the Treasury, to let them pose as tea-planters. Secretary Wilson has lately slooped over in a statement, 'we are succeeding admirably in producing tea in the United States.' As a fad, supported by the Treasury of the United States, it is a very pretty occupation, but, from a commercial stand-point, the quality of the stuff as yet produced, makes his remarks rank nonsense."—*H. and C. Mail*, Sept. 20.

LONDON-INDIAN TEA COMPANIES.

We have received Mr George Seton's annual table setting forth the results for the season 1900 of the working of forty-five Indian Tea Companies registered in London. There is no more carefully compiled or, within its range, more valuable compilation of Indian Tea Company statistics than this. Year after year Mr Seton's figures enable tea shareholders and the trade to follow the course of business and to estimate future probabilities. For the past year we regret to say the figures in the table confirm all that has been advanced in our columns about the unsatisfactory position of Indian tea cultivation. Running through the totals but omitting a comparison of the total capital, because this year debenture issues have been added in the table to the share capital figures heretofore alone given, raising the total by nearly £800,000 to £8,760,000, we find first of all that 10,600 acres additional matured garden were harvested in the past season, the total having risen to 162,690 acres. This involved, however, a decrease of 8,491 acres in the area of immature gardens under cultivation, so that the aggregate increase of cultivated area was rather less than 2,200 acres. From the plants on this ground 79,272,489 lb. of tea were gathered, or 6,932,320 lb. more than in the season 1899. That this increase was not the product of the small net increase in the acreage, is proved by the fact that 12 lb. per acre more tea were harvested last season than in the previous one, the 1900 total being 487 lb. per acre. In the present state of trade that additional output was not any benefit to the companies, whose working expenses alone ran up £149,397 to a total of £2,136,407 so that, even had the price obtained for the leaf averaged as much as in the preceding year, the net results would have been unsatisfactory. As it was, the average price receded 0·13d per lb. or 17 per cent to 6·47d.

Taking the lower average price and the somewhat higher working cost together, it followed as a matter of course that the profit fell off £245,100 to £279 554. It was in fact 0·89d per lb. lower, although the gross income fell off only £95,703 to £2,415,961. This represented a decline of fully 1d in the lb, and the ratio of expenses to receipts rose to 88 per cent, compared with 79 per cent the year before. This again invol-

ved a decrease of £1 13s 10d in the profit per acre, which fell from £3 8s 2d to £1 14s 4d, and meant that the profit on the total capital was only 3·20 per cent compared with 6·59 per cent in 1899. From all this a decline in the average dividend naturally ensured, and the distribution on the total capital fell to 3·90 per cent compared with 5·65 per cent for the season 1899. Even so, however, the dividends paid exceed the profits, their aggregate amount being £346 928 or £102,386 less than in the preceding season. But to pay even this the reserves and balance carried forward had to be reduced by £70,469 to £498,681. How disastrous the season was to the companies may be measured to some extent by looking in detail at some of the figures relating to individual companies, but we can do this only in the most summary way, for lack of space. In 1899 there were three companies whose teas commanded upwards of 11d per lb in the market and eight that obtained more than 10d, while there was only one among the whole forty-five whose crop realised less than an average of 6d per lb. In the past season not one single company secured as much as 11d per lb for its tea, and only five got more than 10d, while there were eleven Companies that received less than 6d, and five whose average sales yielded between 4·45d and 4·56d per lb. How far the additional weight marketed had to do with the decline in price thus roughly exhibited, and how far it was due to increased British taxation, we are unable to say, but would naturally ascribe the fall to the increased supply more than to any other cause. By another year we shall perhaps see more clearly.—*Investors' Review*, Sept. 21.

PLANTING NOTES.

"BLUE MOUNTAIN" SEED.—Those who were fortunate in getting a pound of the new Blue Mountain seed from Jamaica report that this seed is germinating splendidly and shews every sign of coming on well.—*Central African Times*, August 17.

"CEYLON TEA ON THE CONTINENT."—We direct attention to the long and interesting letter from Mr. Renton which will be found on another page: he is evidently covering a great deal of ground and making some interesting experiments in different countries which ought to bear fruit.

SUGAR.—It is claimed that the price of raw sugar has reached a point where it barely covers the cost of production. Only the most modern plantations in Cuba can expect to secure the coming crop without actual loss. Beet sugar is also down close to the line of actual cost of production.—*American Grocer*, August 28

COFFEE OVER-PRODUCTION.—The over-production of coffee in Brazil has become very serious. According to the following paragraph, one great coffee producing, country at least seems even in worse case than any great Tea producer:—

"Letters reaching Lisbon from Brazil report that the coffee-growing industry of that country is threatened with ruin. The Province of San Paolo is already reduced to a state almost bordering on famine. At the depots of Santos and Rio de Janeiro, stocks are accumulating to an extent which makes them a drug in the market, and the fall in prices is ruinous. The crisis is attributed to the large quantities of coffee now in Central Africa, the Congo, German East Africa, and Uganda. From these regions it is transhipped at Aden or Hodeida, where it becomes "Arabian," if not actually "Mocha."

TEA IN JAVA.—It is very satisfactory to learn, on the authority of Mr. R. C. Wright, that no matter how much the cultivation of tea extends in Java, the production is not likely to exceed the local demand, so greatly is the drinking of tea extending among the Javanese, Malays, &c. This is good news in the interest of the people, as well as of tea planters everywhere. It will be a grand thing when tea becomes the universal drink in India and Ceylon to the ousting of arrack in a large number of cases.

THE MOUNTAINS OF THE MOON.—The volume which Mr J E Moore has just published on this subject has two main lines of interest, says the *Spectator*. It describes the chain of lakes which lie like puddles up the central rift valleys, in proper relation to their geological time and formation, and it pieces together the great central ranges of mountains east of these lakes, until it is difficult not to agree with him that there exists there what is practically an immense central range, often snow-capped and glacier-worn, almost as long as the Rocky Mountains in their United States section. On this subject, he has also proved that instead of there being some single "Mount Ruwenzori" north of Albert Edward Lake, there is a splendid snowy range, "composed of as many different elemental peaks as the Alps seen from the Italian plain." In a length of seventy-five miles visible from one spot were four immense distinct groups of snowy peaks. To talk of "ascending Ruwenzori" is as absurd as to talk of ascending *the Alps*. The forests and their bases, the snow speaks, the glaciers, the astonishing views looking up and looking down, form the subject of the most interesting chapters of the book. We can only touch on a few of the main discoveries. The vegetation is extraordinary. Above the tropical forest in a cold zone lies a *forest of heather*. The heather grows in trees to a height of 8 ft., and these trees, fallen and decayed, cover the old watercourses like rotten platforms. Both the men and the goats which the explorers ingeniously selected to drive up the mountain with them, and so to ensure a food supply, constantly fell in through natural flooring. Various points were reached on a line as long and as high as that between Mont Blanc and St. Gothard. Mr. Moore ascended above the line of snow and ice to a connecting ridge, where calculations showed an altitude of 14,900 ft. and immense snow-fields and green glaciers shone around. Mr Moore admits that South Africa has the finest climate in the world, and says nothing against the high plateaux over which the Uganda railway runs, and from which English ladies have recently returned, after accompanying their relatives on hunting-trips, in the best of health and spirits. Somaliland, too, is all that could be desired in regard to the conditions of health. But Mr Moore deals with the centre, the lakes, the adjacent mountains, the river outlets, and casts an eye over the Upper Nile swamps. Below, to the west, are the endless marshes and feverish forests of the Upper Congo tributaries. Consequently, when he pronounces Central Africa to be unfit for habitation, he passes a verdict on the whole country from the Zambesi north to Gondokoro, and from the central line to the western ocean. It is perhaps as well to know and remember this. It may narrow the area which a certain class of Englishmen think we are bound to police, settle, and "develop."

Correspondence.

To the Editor.

CACAO PLANTING IN COSTA RICA.

[A melancholy interest attaches to the following letter from Costa Rica, the writer—a cacao planter there—being the son of the late Rev. S. Coles, to whose address the manuscript came.—Ed. *T.A.*]

Costa Rica, August 10th, 1901.

(To the Editor of the "Tropical Agriculturist," Colombo, Ceylon.)

Dear Sir,—In reply to your foot-note appended to my article "Coffee in Costa Rica," I give you the benefit of what knowledge I have been able to acquire about Cacao in this country. What is most surprising about it is that with such facilities as exist for its production, it should not be able to supply even the local market, which is a very small one, a few hundred quintals sufficing to supply consumption throughout the republic: one may go to several stores in the cities and villages and enquire for cacao in quite a few before he will find it, and then most likely have to pay about one colon per pound of native best, lower grades from Colombia and Ecuador selling for 60 centimos upwards. It is generally supposed that there are some millions of acres specially adapted for the cultivation of cacao in the following districts of the republic, Golfo Dula, El General, Talamanca, San Carlos, and Matina, the last-named being the only one with railroad advantages. This, however, should not be considered much of a drawback to the others on taking into account the high prices realised in the capital. The principal hindrance to the development of cacao culture on lands known to be of the best, is that unwise legislation has allowed anybody with or without intentions of cultivation to grab up enormous tracts of land wherever they chose by merely "denouncing" them according to a prescribed law: 99 out of 100 who did so, are doing nothing with the land, and are only waiting or somebody to turn up some day, and pay them a big price for it, meanwhile they are stubbornly fighting any small road-tax that is levied once or twice a year: the only lands of account that a poor man can work on are small lots of 50 hectares a piece, along the sea-coast or banks of navigable rivers known as the maritime mile, which can be taken up and held according to what is known as squatter's right, which is indisputable to all-comers as long as it is not abandoned for over one year.

The Government is just beginning to offer some inducement to the culture of cacao by giving premiums of 30 centimes per tree on what is in production, Mrs. Arnold of Limon thereby coming in for a bonanza of some 1,000 colones on her farm in Matina: Messrs. Codleman and Heinsen, who have been planting for the past seven years in San Carlos, also received a considerable benefit from the same source. This coming season should give them splendid returns, and they are well-prepared for it, having put in a great deal of drying apparatus this year, as well as a tramway to different parts of their estate.

It is to be regretted that cacao will not flourish in the most populated part of the country, the central plateau, and it is difficult to foretell when

conditions will change for the better as regards the present tenure of lands. Many are looking hopefully for the opening of the Nicaragua canal, which they believe will be the means of foreign capital developing the enormous plains of San Carlos, and give a river and ocean outlet for all products. In the hands of the present owners the land can never improve.

I am indebted to Mr. Hugo Karlsen of San Carlos for the following details of a farm of 80 acres, that has been run for several years by Mr. W. Armstrong of Bluefields, Nicaragua, and hope that the same may be of interest to your readers. To abbreviate as much as possible I will summarize small items by stating that they call for:—gathering, planting, and taking care of seed; planting cleaning, pruning, marketing of produce; tools, houses, foreman's salary, mules and equipments, boats, drying houses, stationery, etc; values are given in American gold.

First year.—Cutting down forest, planting and cleaning once of 12,000 banana suckers, gathering and planting 10.000 rubber seeds, gathering and planting of 13,000 cacao seeds, erection of houses, etc.					$2,957
Second year.—Transplanting and cleaning rubber and cacao, marketing of 15,000 bunches of bananas ...					1,832
Third year.—Cleaning, replanting, and marketing of bananas ..					1,845
4th year, cleaning, replanting and marketing of bananas					1,920
5th year	do	do	10,000 lb	of cacao	2,405
6th year	do	do	18,000 lb	do	2,575
7th year	do	do	30,000 lb	do	2,805
8th year	do	do	48,000 lb	do	3,425
9th year	do	do	60,000 lb / 15,000 lb / 19,200 lb	do / rubber / rubber	4,365
10th year	do	do	60,000 lb	cacao	4,475
				Total of expenses for ten years...	$28,604

Proceeds.

2nd year,					$
	by sale of	15,000	bunches of bananas	at 16c	2,400
3rd year	do	20,000	do	do	3,200
4th year	do	20,000	do	do	3,200
5th year	do	20,000	do	do	3,200
	do	10,000	lb cacao	at 18c	1,800
6th year	do	20,000	bunches of bananas	at 16c	3,200
	do	18,000	lb cacao	at 18c	3,240
7th year	do	12,000	bunches of bananas	at 16c	1,920
	do	30,000	lb cacao	at 18c	5,400
8th year	do	6,000	bunches of bananas	at 16c	960
	do	4,800	lb cacao	at 18c	8,640
9th year	do	15,000	lb rubber	at 60c	9,000
	do	60,000	lb cacao	at 18o	10,800
10th year	do	19,200	lb rubber	at 60c	11,520
	do	60,000	lb cacao	at 18c	10,800
				Total of proceeds...	$79,280
				Total of expenses...	$28,604
				Profits...	$50,676

I would remark that these are favorable returns. all of which cannot be obtained in some parts as represented here; in the case of bananas nothing could be sold to advantage where the distance from the port or railroad is great. The Bluefields climate must always be a drawback to foreign settlement, whatever advantages it may have in the question of cheap labor; otherwise I see no reasons why similar results should not be obtained in favorable districts in this republic.—I remain, yours truly, E. A. C.

TEA CROPS AND MANURE.

London, E.C., Sept. 6th, 1901.

DEAR SIR,—Under the above heading the *Overland Observer* received this week contains a short editorial comment upon the increased imports of manure and especially upon the marked increase in the quantity sent Upcountry by rail during the year 1900.

Appended to these annual returns for the past few years, there is given a statement of the average yield of tea per acre, and for convenience of reference these several returns are repeated as follows:—

Average yield of Tea per acre.			Manure Imported.		Manure carried by rail.	
		1895	12,487	tons.	7,213	tons.
1896	396 lb.	1896	11,576	do	8,186	do
1897	403 do	1897	10,874	do	8,431	do
1898	400 do	1898	12,745	do	9,025	do
1899	400 do	1899	14,200	do	11,126	do
1900	424 do	1900	20,341	do	17,717	do

The average yield of tea per acre cannot be taken as being dependent upon the manuring, as in the majority of cases it is reasonable to suppose that no manure had been applied, for at present it will be admitted that manuring has only been generally adopted on comparatively a very small number of estates. The increased yield of tea per acre, therefore, given as 424 lb. in 1900 as against 400 lb. per acre in the preceding year of 1899 may fairly be ascribed to the coarser plucking which was so generally resorted to in order to increase the outturn as a consequence of a demand for tea of low quality.

The real interest in these returns is in reference to the increased imports of manure which have risen from 14,200 tons in 1899 to 20,341 tons in 1900.

Further, of this 20,341 tons imported 17,717 tons were carried Upcountry by rail as against only 11,126 tons so carried in 1899. Obviously, therefore, the great bulk of the manure imported is sent Upcountry, presumably for application on tea and coffee estates.

In 1895 the manure carried by rail was only 7,213 tons so that in six years the quantity of manure so carried had more than doubled.

It would, of course, be interesting to know what proportion of the 17,717 tons was carried up during the first six months of 1900, also whether the returns for the first six months of the present year at all correspond in tonnage. Probably the low prices which have been obtained for the past year have materially checked the application of manure on certain estates.

But nevertheless the very remarkable increase in manuring is evidently the result of practical experience. Planters on estates above 2,000 feet, are finding out that an exhausting crop like tea cannot be maintained in a flourishing condition on a naturally poor soil with a heavy rainfall, without some manurial assistance. As the writer has frequently pointed out in private reports the manure for Tea, or rather the judicious combination of different manures, should be so arranged that only a moderate percentage of nitrogenous ingredients in different degrees of solubility should be supplied, in union with a more generous quantity of potash salts which constitute the dominant element in the mineral portion of Tea, to which also must be added Phosphate of lime in an alkaline form, readily available as plant food.

From the reports of the practical results of such a system of manuring which the writer has received direct from planters, there certainly is every prospect that judicious manuring will continue to be carried out on the tea estates of Ceylon.

In conclusion it may be mentioned that in order to withstand the attacks of grubs and bugs it is very desirable that Bone dust, dried Fish, dried Blood or even crushed Cake should be chemically treated or mixed with chemical salts before application; otherwise such dressings may encourage insect life rather than benefit the Tea shrub.

JOHN HUGHES.

ANTIQUATED NOTIONS ABOUT THE DATE-TREE.

(To the Editor of the *Tropical Agriculturist.)*

12th Sept., 1901.

SIR,—There are some persons that still believe that the Date-Palm grows and flourishes in deserts—which it never did, and never will do.

The Date-tree, like other trees, requires certain conditions of climate and soil. But apart from these, one of the first conditions of its healthy development is *irrigation.* In the desert of the Sahara it can be grown only in oasis, where there are springs of water. It does not seem to mind brackish water, and to bring out the luscious quality of the best varieties, they require in-addition manure.

The following quotation, from the Journal of the Royal Horticultural Society of England for August 1901, p. 213, may interest the readers of the *Tropical Agriculturist:* "Date-trees in Spain (Rev. Hort. Belge, May 1901)—Contrary to the usual opinion that Dates do not ripen in S. Europe, there is at least one locality where trees produce excellent fruit. Elche is a small town near the Mediterranean which has an 'oasis' of Date-trees, yielding excellent fruit equal to those of the Algerian Sahara. They were introduced and grown by the Moors when ruling Spain; to whom also was the introduction of the orange due into Valencia and Protugal. The Dates are of a good variety. They are multiplied, just as the African Arabs used to do it, by separating the shoots from the base, and not by sowing the stones. Twenty-five female trees are fertilized by means of one male."—G. H. The probability is that the Date-Palm *was* introduced into Spain by the Moors , but it is doubtful whether what is known as the Valencia or Portugal orange was known to the Moors. The bitter, or Seville orange, was known to the Arabs, and it is *that* which the Moors probably introduced into Spain.

In Oranges and Lemons of India and Ceylon p. 225, there is a letter from Sir C F Bonham which points to the introduction of the Portugal orange into the Peninsula by the Portuguese from China, or the Malay Archipelago, after they had doubled the Cape. It is probable that in many parts of Queensland, and perhaps other parts of Australia, and of South Africa, the Date-Palm would flourish, and become of importance to the inhabitants. Its requirements are a suitable climate and soil, and water ; and the two former can be discovered only by experiment. If the stones of the best Dates (Tafilet, and others) were sown as an experiment, they might reveal whether the climate and soil were suitable to the healthy growth of their palm. There would be uncer-

tainty about the sexes that would result from the seeds, but they would undoubtedly show whether the climate and soil were suitable. It is reported that the Americans are making an effort to introduce the Date-Palm in Arizona.

E. BONAVIA, M.D.

CACAO AND CRITICISM.

Sept. 28.

DEAR SIR,—"Pod" has the *cacoethes loquendi* (*et scribendi*) and gets inebriated with the exuberance of his own verbosity. Is he not the gentleman who lectured before the Uva Cacao Committee in June last on the *academic* question of growing suckers? He is more adept in dialectics than in practical enquiry or application. His accusation of tactlessness in the Committee's questions is ridiculous. It is quite optional to answer or not, any or all or none, of the questions submitted in the *amended* circular of 26th July. District Associations can have as many copies as they please for distribution among those interested (if they will apply to Secretary, P. A.)

Having asked the aid of a Scientist in formulating the queries and some experienced planters having passed in Committee the questions aforesaid, it is absurd of "Pod" to pose as one who desires information he cannot reach, and yet himself act only as a captious and not too well-informed critic.

The parody in your issue of the 20th on the "Mahawansa," is clever as a literary *jeu d'esprit* and was worthy of a good hearty laugh. Even the poor casket incident, though in questionable taste, was irresistible to anyone knowing the original. Those who are curious enough will find enlightenment in Barthelemy Saint Hilaire's "The Buddha and his religion" (in the appendix at the end of the volume.)

Questions which may seem unimportant to some, may be most interesting to others. We have undoubtedly to thank the Mycologist for *identifying* the worst pest cacao has yet suffered from. Sunlight is the best cure, and we have had very sunless weather this year in many districts, and yet the battle is, I think, in our favour, using the various methods suggested by Mr. C. If that gentleman could give more time to cacao interests, and if he credited average planters with more knowledge, intelligence and common-sense generally than he has implied in some of his imperfectly prepared lectures, we should all score in the end, for his abilities are undoubted. Kew and Peradeniya are somewhat too prone to scorn the practical agriculturist, and to encourage too exclusively the scientific work of the Gardens.

But I must stop. It might be wise to enlarge the Cacao Committee and try to increase interest in this product; but we do not want over-production! —Yours truly,

IN CACAO.

SIZE OF "TEA GARDEN" FOR ECONOMICAL MANAGEMENT.

Sept. 29.

DEAR SIR,—I have never given the question of the best size of a tea garden, from an economical point of view, any special hought; so much depends on the bearing ualities of the estate.

But an ordinary decent place for one man to work should not, I think, be more than 300 to 350 acres. With a good assistant he could do double that.—Yours truly,

PROPRIETOR AND MANAGER.

LARGE *vs.* SMALL TEA GARDENS:

THE BEST SIZE FROM AN ECONOMICAL POINT OF VIEW.

Oct. 5.

DEAR SIR,—As to the profitable size of a tea garden, it depends very much on the age, elevation, soil, &c.; but I think about 300 acres is a workable average. Where manufacture can be centralised I believe in the grouping of estates under a *permanent* staff. As things are, every superintendent has to spend a great deal of his time in correspondence, finessing and arranging about labour, doctoring coolies, &c., which on larger estates could be more organized and combined. This is, from the purely commercial point of view, the desideratum to be aimed at; but a more ideal system I consider to be a smaller and individual proprietorship, growing the leaf and supplying it to central factories; these being worked as separate concerns, like the creameries and butter factories in Australia. But it is too late in the day for this now and it is no use crying over "spilt milk."—Yours truly,

AN OLD HAND AT TEA.

THE CACAO CIRCULAR: A SEVERE CRITIC.

Wattegama, Oct. 10.

DEAR SIR,—I welcome P.O.D.'s challenge to "In Cacao", but I would much prefer to listen to the combatants in the Planters' Hall and in the presence of any cacao planter who may wish to listen to or take part in the argument; for our Cacao Committee has sent out circulars—like the one I have received—with a number of foolish questions which at least some of the Committee ought to have been able to answer on the spot, if they are entitled to serve on the Committee. I have no desire personally for further information *re* Cacao as *I* can tell from appearance of leaf, bark, and pods, the requirements of the trees; and the taste of the dye extracted from the soil around the trees is of further use to prove the correctness. As we have so many planters able and willing to speak out, I, as an old planter of 43 years' experience and 70 years of age, left younger men to carry on correspondence, &c., of late; but this circular is so silly that I welcome P.O.D. —Yours faithfully,

JOSEPH HOLLOWAY.

THE JAVA COFFEE CROP, 1901.

According to a telegram sent to Europe by the Governor-General of Netherlands India, the Government coffee crop in Java is estimated for the year at 95,000 piculs.—*Straits Times*, Sept. 30.

SIR JOHN MUIR COMPANIES.

ANGLO-AMERICAN DIRECT TEA TRADING COMPANY, LIMITED.

At last we have been able to get sight of the report of this Company for the year ended November 30th last, but it has not illuminated us much. It is printed on the same coloured paper as the reports of other subsidiary companies of the Consolidated Tea and Lands parent and the directorial report signed by "James Finlay and Company, Secretaries," is divided into the same kind of paragraphs telling us about the quantity of tea marketed, the extensions of the acreage cultivated, the balance at credit of profit and loss, and sundry other matters, but into the true position of the company we get not the slightest glimpse. Very little profit has come from the company's estates in Ceylon, we are told, because of the fall in prices, but the directors are glad to state that Ceylon producers generally are now "plucking much finer," therefore it is hoped that an enhanced averaged price will be realised by the company in 1901. Even so, we cannot think it will be benefited much, for coffee is falling in price, and the company does seem to produce a little of that berry, although its directors are careful to avoid confiding to their shareholders how much. What, though, has become of the "direct trading" portion of the business? It is all very well to inform shareholders that "Cardamoms are produced in the form of three-celled capsules, containing numerous seeds which yield an aromatic pungent spice with a peculiar but agreeable taste." This is interesting and quite nice, but where is the market for the company's teas in America of which so much was originally made? There is not a syllable about the subject in the report, nor can we trace anything relating to it in the accounts.

In order to bring the statistics of these various and fascinatingly peculiar emanations of Sir John Muir's company-framing industry into uniformity we have drawn up tables to exhibit the figures of this company on the same lines as those laid down for his other companies in last week's issue. These tables show that the Anglo-American Direct Tea Trading Company offers as good an example of the financial "rake's progress" as any one of them. It has extended the acreage under cultivation somewhat in the year ended November 30th last, and marketed a much larger crop of tea but the price exhibited a disastrous fall, and worse, than all, the company has to lean more and more upon borrowed money, while dividends on the ordinary shares, have become impossible. Twelve months before, the directors boldly paid a five per cent dividend, with a four per cent bonus, making nine per cent for the year on those shares and for last year they got nothing, in spite of the large amount of additional money poured into the business. This "manœuvring with capital" has become quite appalling. The paid-up share capital remains much as it was twelve months before, but loans and advances from shareholders have risen from £156,000 to £233,000, and advances by bankers from £171,000 to £202,000. The company thus owes £108,000 more than it did twelve months previously, and has not a rag of a Scotch £1 note to show for the money. All that we can discover is a slight increase in the value of the tea pledged to the bankers against advances, but that increase left the bankers uncovered at the date of the balance sheet to the extent of £145,000. What have they got for that money? Adding it to the debt of the other companies, over £500,000 has been advanced by bankers to the various companies known as the Muir group, apparently without security unless the "investments" paraded in the accounts are pledged to them. But these investments have all shrunk in value, so far as we know, and probably could not now be realised at one-half their cost price. It is only necessary to state facts of this description to indicate what a bottomless quagmire of unstable credit the accounts of these companies present. We must, however, congratulate the directors on being able to write off £434 on account of preliminary expenses during the past year, although this is almost balanced by the increase in the suspense account for coolies, &c. That, however, is the only word of commendation it is possible to utter, and against it we must place a decrease of over £2,700 in the cash, the total of which is now down for £1,117. No wonder it was deemed prudent to abstain from declaring any dividend on the ordinary shares. Who holds these ordinary shares? Not the public, it is to be hoped. If the public, may the gods help them! Sir John won't.

ANGLO-AMERICAN DIRECT TEA TRADING COMPANY.

	1899.	1900
Cultivated area (tea, coffee, cardamoms)	14,449 acres	15,222 acres
Tea crop	2,955,750 lb.†	3,520,332 lb.
Average price	9·83d	6·37d
	£	£
Proceeds of tea and coffee sold	92,666	95,987
Transfer fees	·	3
Dividends and interest	10,792	10,889
Balances brought up	17,047	6,449
Total	120,505	113,327
Working expenses	75,419*	84,313*
Commissions on profit	438	392
Interest, &c.	5,719	5,120
Net profit	38,930	23,552
Preferred share dividend	14,849	16,543
Ordinary Share dividend and bonus (5 per cent and 4 per cent)	17,631	—
Balances forward	6,449	7,010

ITEMS IN THE A/CS, CAPITAL AND DEBT.

	1899.	1900.
Dr.	£	£
Paid-up share capital	528,788	529,446
Loans and advances by shareholders, &c.	155,869	232,691
Bankers' loans	170,970	202,003
Sundry creditors	4,918	7,175
Reserve	13,600	13,600
Current charges unpaid	11,419	7,528

* Including £2,073 commission paid to Finlay, Muir & Co. and £1,047 to P R Buchanan & Co. in 1899, and £2,045 and £1,023 respectively in 1900.

† Coffee crop not given in either year, only estimates of coming crop and estimates of price, the latter 44s per cwt. in 1900, against 63s in 1899.

ITEMS IN THE A/CS, CAPITAL AND DEBT.

Cr.	1889. £	1900. £
Cost of properties	672,229	735,895
Value of tea pledged to bankers	42,974	57,095
Stores	4,405	5,297
Suspense account for coolies, &c.	4,20[illegible]	4,792
Preliminary expenses	434	—
Loans in India and Ceylon	49,266	54,865
Cash	3,838	1,117
Sundry debtors	18,407	12,281
Sundry Investments, at cost	121,536	135,769

—*Investors' Review*, Sept. 14.

THE CONSOLIDATED ESTATES CO., LTD.

The tenth annual report of the general managers, to be submitted to the shareholders at the general meeting, to be held at 34, Great St. Helens, E.C., on Wednesday next, states that the profit and loss account shows a balance (including £596 18s 7d brought forward from last year) of £3,488 2s 9d, after paying interest on the Debentures, and an interim dividend of 4 per cent on the Preferred shares. Out of this sum the general managers propose to pay a balance dividend of 4 per cent on the Preferred shares, making 8 per cent for the whole year, which will absorb £1,480; to set aside for redemption of 2 per cent of the Debentures at 103, £927; carrying forward the balance, viz., £1,081 2s 9d. Total £3,488 2s 9d. (By the articles of Association it is provided that no dividend can be paid on the ordinary shares in any one year unless 5 per cent of the debentures have been redeemed for that year). The following shows the result of the year's working viz:—Net proceeds of Crop—1,787,560 lb of tea at an average net price of about 5 5-16d per lb realised £39.715 17s 9d; cocoa, cardamoms, cinchona bark, and cinnamon, £961 19s 7d; surplus on estimated value of produce brought forward from 1899-1900, £330 1s 6d; interest on account, £109 12s 3d; total, £41,117 11s 1d. Expenditure on Estates—Messrs. George Steuart and Co.'s drafts—R480,732 at an average of 1s 4 2·6$\frac{3}{4}$d per rupee, £32,784 2s 6d; balance of coast advances, £300 8s 3d; bonus to superintendents—R4,000 at 1s 4 1-16d, £267 14s 2d. The shareholders are no doubt aware that, owing to the heavy fall in the price of tea, the past year has been an unfortunate one for tea-producing companies, and the general managers much regret that they are unable to recommend the payment of any dividend on the ordinary shares, but they think the result of the year's working is not unfavourable as compared with that of other similar companies. They are also glad to say that the prospects for the new season are much more satisfactory, for not only is the market in a much stronger position, but also some further economy in the production may be looked for, while the crops are still increasing, and with normal weather it is hoped that a further addition of about 50,000 may be expected. During the past season the weather in Ceylon was favourable for the growth of tea, and it will be seen that the actual crop exceeded the estimate by over 100,000 lb., so that, but for the heavy fall in price, the results would have been quite satisfactory. The fall was mainly due to over-production, but planters are now thoroughly alive to the danger of this, and shipments from Ceylon show a considerable reduction, while the consumption continues to increase. The cost of production on the company's estates was slightly in excess of that of last year, which is due to the large sum spent in manuring; the arrangements for this had been made, and in fact nearly all the manure had actually been applied before the serious fall in price of tea took place, but during the new season it will not be necessary to spend nearly as much on this item, as the company's estates are now in a high state of cultivation; but the subject is one which engages the special attention both of the general managers and the company's agents in Ceylon. Exchange during the past twelve months has been slightly more favourable for the company, the average rate for three months' drafts having been 1s 4 23-64d, against 1s 4 31-64d last year. The amount realised from products other than tea is rather less than the estimate, which is mainly due to the fact that it was found necessary to let a good deal of the cinchona bark stand over till the present season, and consequently only about half the quantity estimated for was actually harvested. The crop of cardamoms was also somewhat short of the estimate. No new properties have been acquired since the date of the last annual report, and the total acreage of the company's estimates remains unaltered—viz., 5,484 acres. But it has been decided to abandon the cultivation of a plot of about 70 acres on Warriagalla which does not pay, and the land under tea is thus reduced from 3,927 to 3,857 acres.

The usual tabulated statement showing the distribution of the acreage is appended, but a careful survey of the reserve land suitable for Tea is being made, and this will probably result in some slight alteration of the figures given below:—

Name of Estate.	Ceylon District.	Tea Full Bearing.	Tea Partial Bearing.	Tea Recently Planted.	Reserve Suitable for Tea.	Other Products, Grass Waste, Water, &c.	Total Acreage.
Wattegodde	Dimbula	800	Nil	25	Nil	70	895
Hoonoocotua	Kotmale	560	25	15	45	117	762
Tallagalla	Kalutara	515	48	54	60	23	700
Ellagalla	Matale	225	6	9	38	167	445
Rutland	Hewaheta	443	6	70	85	59	663
Wariagalla	Nilambe	423	61	26	57	694	1,261
Sorana	Kalutara	422	79	45	81	131	758
	Total	3,388	225	244	366	1,261*	5,484

The capital expenditure last year somewhat exceeded the estimate, as the requirements on factory and machinery account were found to be rather larger than had been anticipated, the estimate having been £1,800, whereas the actual expenditure amounted to £2,210 10s 7d, thus bringing the total amount at debit of the factory and extension account to £6,544 4s 1d. To provide for this and further small requirements in the future the general managers made an issue in July, as the shareholders are aware, of £2,000 in £10 Preferred shares, and £5,000 in 5 per cent. Debentures, which have all been taken up, but mainly by the general managers under their guarantee. As, however, this issue was made in July, the figures in connection with it do not appear in the annexed

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* Of which more than 300 acres are planted with Cardamoms, Cocoa, Cinnamon and Cinchona.

accounts, which are for the year ending June 30. For the present it has been decided to discontinue the extension of cultivation, as the shareholders seem for the most part disinclined to provide the additional capital that would be necessary, and the expenditure on factory and extension account will therefore in the future be small. It is estimated for next year at about £600 to £700, and is chiefly required for the upkeep of the extensions of tea and cardamoms made during the last two or three years, which are not yet in bearing.

The Estimates of Crop Expenditure and Yield for the New Season have as usual been very carefully prepared, and are as follows:—

	Expenditure. R.	Crop. lb. Tea.
Wattegodde ..	114,141 ..	440,000
Hoono cotua ..	78,687 ..	280,000
Ellagalla ..	28,469 ..	120,000
Tallagalla ..	62,785 ..	250,000
Warriagalla ..	60,196 ..	230,000
Rutland ..	62,309 ..	240,000
Sorana ..	66,422 ..	275,000
Totals	R473,009 @ 1/4⅜ = £32,273.	1,835,000

Also about 20,000 lb. of Cinchona from Rutland 6,500 lb. Cardamoms, and 1,680 lb. Cocoa from Warriagalla, and 15,000 lb. Cinnamon from Sorana; the value of the whole of such products being estimated at about £1,000 to £1,200.

The general managers are glad to be able to state that the reports they have received as to the condition of the company's estates continue to be very satisfactory, and there is almost an entire absence of blight or pest of any kind, so that with normal weather and even moderate prices for tea, the prospects for the coming season appear to be decidedly hopeful.

NAHALMA TEA ESTATES COMPANY, LIMITED.

The report states that there is a loss for the year ended December 31st, 1900, after providing for general expenses, directors' and auditors' fees, interest on debentures, &c , of £1,544. It is proposed to adjust the accounts in the company's books by writing £910 off the balance of the amount set aside for the redemption of debentures, and £109 off the amount set aside for provision against loss on coolie advances. There was also a credit balance carried forward from profit and loss for 1899 of £100, which leaves a debit balance to be carried forward to 1901 of £423.—*Home & Colonial Mail*, September 27.

REPORT OF THE DIRECTORS

to be presented to the shareholders at the seventh annual ordinary general meeting, to be held on Wednesday, October 16th :—

The Directors beg to submit the general balance sheet and profit and loss account for the twelve months ending 31st December, 1900, duly audited, which results in a loss for the year ending 31st December, 1900, after providing for general expenses, Directors' and Auditors' fees, interest on debentures, &c., of £1,544 7s 9d. It is proposed to adjust the account in the Company's books by writing off this sum the following items :—The balance of the amount set aside for the redemption of debentures £910 2s. 6d ; the amount set aside for provision against loss on coolie advances £109 11s. 6d ; there was also a credit balance carried forward from profit and loss for 1899 of £100 14s. 8d ; which leaves a debit balance to be carried forward to 1901 of £423 19s 1d.

The Directors beg to hand their report for 1900. The crop obtained was 208,419 lb as against an estimate of 230,000. The debenture holders and shareholders have been fully advised as to the various causes tending to contribute towards the disastrous position of the Company. Messrs Bosanquet & Co., Colombo, have been appointed the agents to the Company in Ceylon as from 1st April, 1901.

The acreage of the Company's properties on 31st December last remained unaltered, at—Tea in full bearing, 446 acres; jungle, 246 acres; total 692 acres.

The Directors report that Mr. Arthur Marshall has resigned his seat upon the Board ; they have also to record the resignation of Mr. William Forsythe. Mr. Richard Arthur Bosanquet was elected a Director of the Company at an extraordinary general meeting of the shareholders in November last.

Mr. John Abernethy, the Director retiring by rotation, being eligible, offers himself for re-election. Mr. Richard Arthur Bosanquet being eligible also offers himself for re-election.

Messrs Fox, Sissons & Co., Auditors to the Company, offer themselves for re-election.

DOOMOO TEA COMPANY OF CEYLON, LTD.

REPORT OF THE DIRECTORS.

Your Directors beg to submit their Report and Accounts for the season ending 30th June, 1901.

The Tea produced on the two Estates was 240,130 lb costing 26·95 cents per lb and realising 40·39 cents per lb as against 40·57 cents for last season, a result which may be considered eminently satisfactory in view of the condition of the tea market during the financial year.

During the year a new bungalow has been built on Verellapatna at a cost of R3,000 and the estimates for the present season provide for the erection of fans on Verellapatna factory at a cost of R3,500, which it is hoped will improve the manufacture of the tea.

	R.
The amount available to be dealt with is	37,481·22
and your directors recommend that a divided of 7 per cent be paid absorbing	28,000·00
That there be passed to Depreciation account a sum of	2,500·00
That there be passed to Reserve account a sum of	5,000·00
That there be carried forward a sum of ...	1,981·22
	37,481·22

The estimates for the current season provide for a crop of 260,000 lb tea at a cost of R69,838 exclusive of Capital Expenditure.

The acreage of the two Estates is as follows :—

Doomoo ..	213 acres	Tea 5 years old and upwards.
	9 ,,	,, under 2 years old.
	19 ,,	Timber.
	58 ,,	Chena and Patana.
	299	
Verellapatna	465 acres	Tea 5 years old and upwards.
	35 ,,	,, 4 ,,
	24 ,,	,, 3 ,,
	10 ,,	Grass.
	154 ,,	Chena and Patana.
	680	

In accordance with the Articles of Association Mr. W D Gibbon retires from the board, but being eligible offers himself for re-election.

It will be necessary to appoint an Auditor for season 1901-2.

THE MAZAWATTE COMPANY: CHOCOLATE AND COCOA.

NEW "ALL-BRITISH" ENTERPRISE.

(*Globe*, Sept. 27.)

One may fairly describe chocolate as the queen of sweetmeats. Thanks to the foreigner, who often supplies us with what we could well provide for ourselves, eating chocolate has long usurped whatever position drinking chocolate may have held in the past, and where the cocoa bean is used in liquid form it is as cocoa pure and simple that we know it. After all, the difference between chocolate and cocoa is largely one of degree—the degree of butter, in fact, which is extracted or is allowed to remain. A cocoa bean contains something like 50 per cent of butter; for cocoa essence this is nearly all extracted, but in making chocolate of the best quality the rich vegetable oil is not to any considerable extent interfered with, whereas in chocolate of the lower grades (and it is to be feared a good many people know none other), for the natural butter, which is a very marketable commodity, there is substituted inferior animal fats, while arrowroot, sago, and all kinds of colouring matter find a home in the cheaper chocolates that have but slight acquaintance with the cocoa bean, and that only with the husk discarded by the high-class manufacturer.

Holland, France, Switzerland, and Germany have, so far, almost monopolised the trade in the best chocolate and the finest cocoa essence in this country, and it is interesting to learn that an attempt is to be made by the Mazawattee Company to capture some of this trade from the hand of the foreigner. Of course, competition being what it is, the public is not prone to extend any particular favour to an article simply because it is British-made. This fact is often deplored, but the answer (and one which the Mazawattee Company would surely make) is that the buyer seeks the best article for his money, whether it bears a Dutch name or a French title. It is such a commodity that the vast undertaking so long identified with packet teas promises to place on the market, and, having regard to assured reputation, no less than to the elaborate preparations, extending over five years, for entrance upon the new enterprise, and to the unique facilities for distribution possessed by the firm, promise may almost be taken as performance. Something not far short of half-a-million sterling has been sunk in the enterprise, which is not only already giving work to about 3,000 hands at New Cross, but is further stimulating trade with our Colonies.

Some of the finest of the cocoa beans come from Ceylon, while a large quantity is imported from Trinidad; and in the making of the chocolate in all its varied form—but of one quality—at New Cross, including the most popular milk chocolate, in regard to which again the foreigner must now look to his own, cocoa from our British Colonies is alone being used by Mazawatte. At New Cross this new and self-contained enterprise, with which the public will make more intimate acquaintance in a few days, is now in full swing. Everything is done there—from washing the cocoa bean to turning out the chocolate with that bloom and smoothness of surface known to the connoisseur and producing the best of cocoa essence, and from cutting the tin to finishing the boxes in which the chocolates are so daintily placed. Cardboard is said to contaminate, and is therefore to be rigidly excluded. The works cover an immense acreage, divided almost equally between the tea trade and the new industry, which has its centre at New Cross. It is a bold venture and a big one, which, as a purely British enterprise, may be wished that success which is already assured.

DISEASES OF CHILDREN AND THEIR TREATMENT:

BY J. L. VANDERSTRAATEN, M. D.*

This very valuable work, which has been out of print for some time, has now passed through a fourth edition. It used to be *the* book to which every English-reading mother in Ceylon, turned in time of sickness, and in which she seldom sought in vain for guidance. Dr. Vanderstraaten had had so many years' experience in Ceylon that he knew just how to direct and advise. The first Edition appeared in 1873 and now the work has been completely revised; the chapters on the management of children in Health and in Illness have been re-written and several additions have been made to the Table of Ailments, while another chapter on Directions for Infant Feeding is given. The book itself is divided into two parts:—Part I contains a concise account of each disease so that the symptoms may be readily recognized before the treatment is attempted. The List of Medicines in general use and the Table of Prescriptions, contain the doses suited to children, from under one year to ten years of age. In addition to the results of the Doctor's own experience, much of the valuable information in this part is obtained from the works of Drs. Goodeve, Hooper, Kesteven Rees, Tanner and West. A section on Accidents and Poisons is also added. Part II. is composed mostly of extracts on the Hygienic and the General Management of the Young, the most valuable extracts being from Goodeve's Hints for Management of Children in India. The Address to Nurses, by Dr. West should be studied carefully by mothers.

The work is one that every mother ought to keep close at hand. It tells when a doctor ought to be called in, and gives such clear directions what to do when symptoms are first observed that no time is lost before the Medical man can appear. Especially on tea and other estates should this little volume be valued. Goodeve's work is a larger and more expensive one and, for fevers especially, is fuller, but, in a general way, this book will be found the more handy. The prescriptions are such as any one can understand and copy for the chemist and then the Alphabetical List of Medicines, giving their Operation, Diseases in which gives doses according to age, and remarks, is one to be often consulted.

Equally valuable is the chapter one the Preparation of Invalid's Food, that on Nursing and what not to do, and one on cholera, precautions against it and the treatment of it

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* Published by A. M. & J. Ferguson, Colombo. Price R2·60 by V. P. P. Post.

PLANTING NOTES.

Mr W Watson has been granted a special license for the purpose of issuing certificates to any persons having control of any boiler or boilers used in any factory.—*Gazette.*

Cocoa and Banana Planting in Central America.—We direct attention to a letter on this subject on page 333 from a British planter in Costa Rica. He gives us figures of a highly satisfactory kind; but these are not on his own experience, and seem almost based too good to be true. However, we give them *quantum aleant.*

Trout in New Zealand.—Twenty thousand trout ova were received at Rotorua from the Okoroire trout hatchery a few weeks ago. The ova has now developed into healthy little fry.—*Auckland News*, September 12.—An enormous male trout was recently found lying dead near the mouth of the Mimihau river, a tributary of the Mataura river. It was 3ft. 1in. in length, and although in very poor condition, weighed no less than 18lb.—*N. Z. Mail*, September 11.

Aloe in Flower.—There is now being exhibited in the conservatory at the West Park, Wolverhampton, a fine specimen of the American aloe which is said only to flower once in about a hundred years. It has been given to the Park Committee by Mr H Lovatt, of Law Hill Hall, and as it is now commencing to flower it will doubtless be an object of interest for several weeks. It is 18ft high, and it is estimated that it will develop about 2,000 blooms.—*Globe*, Sept. 27.

Doomoo Tea Company. — Elsewhere we give an account of the proceedings at the annual general meeting of this Company which discloses a state of affairs upon which the shareholders may very well be congratulated, considering the condition of the market during the year. A dividend of 7 per cent has been declared and considerable aditions made to the depreciation and reserve accounts while there is a balance of nearly R2,000 to be carried forward. A good deal of attention has been paid to Verellapatna estate and there is every reason to believe that the new factory which it is proposed to erect there, will help very materially in improving the manufacture of tea.

Fruit and Leaf Crops.—We have in the Island hill districts whose climate hardly suited coffee, so far as fruiting at least went, as well as it suited the health and comfort of the European Proprietor and Superintendent, and in the low-country there are tracts in which the coconut tree flourishes luxuriantly, but which are too rainy to bear paying crops. In the Upper Shillory Experimental Farm in Assam, they are just beginning to realise that, while there is no difficulty in raising fodder crops, and in preserving them for cattle in the winter. When natural grass is very scarce in parts, seed crops yield disappointing results. Grasses, cloves and even root crops have been successful; but wheat, barley, oats and linseed have proved very disappointing owing to the rains setting in about the time of flowering, and preventing the development of seed.

"The Agricultural Gazette" of New South Wales. Issued by Direction of the Hon. John Kidd, M. P., Secretary for Mines and Agriculture. Edited by W. H Clarke, for August 1901 has the following contents :—Introduction by the Under Secretary for Mines and Agriculture; Report of the Chief Inspector of Agriculture; Report of the Chemist; Report of the Entomologist; Report of the Dairy Expert; Report of the Fruit Expert; Report of the Wheat Experimentalist; Report of the Viticulturist; Report of the Inspector of Agriculture and Timber; Report of the Fruit Inpectors; Report of the Principal, Hawkesbury Agricultural College; Report of the Manager, Wagga Experimental Farm; Report of the Manager, Bathurst Experimental Farm; Report of the Manager, Wollonghar Experimental Farm; Report of the Manager Pera Bore Experimental Farm; Report of the Manager, Coolahah Experimental Farm; Report of the Secretary, Board for Exports; List of Agricultura Societies' Shows, 1901.

Central Africa and Seed Importation.—The mail from Central Africa brings us news of importance to those who have coffee and cocoa seed for sale, in the announcement that the B C A Chamber of Agriculture and Commerce has asked the Commissioner to permit a specially chosen committee to consider applications to import economic seeds from countries at present prohibited under the Coffee Leaf Disease Regulation Act of 1894. Coffee seed will be imported as "cherry-dried" only, and all seeds will be chemically disinfected. The need of new products is being felt, and the following (*Central African Times*, Aug. 24th) is germane to the subject :—

Mr. J W Moir, of Lauderdale Estate, Mlanje, who has for many years imported Jamaica Coffee seed, has another consignment on the way now which we trust will prove successful. Mr. Moir deserves credit for his persistent efforts to introduce not only new Coffee seed, but also to establish the Cocoa plant in this country.

Seed for Central Africa.—With reference to this subject, upon which we quote fully elsewhere, the *Central African Times* has the following :—

We think it may be said that the Planters have supported the Administration throughout and that the present untoward result is due to the extreme stringency imposed upon both the Administration and the Planters by the Kew authorities with, we may remark, the very best intentions. The Regulations so far have been completely successful and as yet we have been able to keep the leaf disease at bay. In barring the importation of seed from all countries where leaf disease is known to be, or has been, we have, however, handicapped ourselves to a tremendous extent as, unfortunately for a young country like ours, we have been unable to import seed from all those countries which are our immediate neighbours. We have, in fact, had to face the problem of importing our seed from the uttermost ends of the earth and seed is a commodity which cannot stand long carriage. For example, it is practically impossible to establish cocoa here because in ninety-nine cases out of a hundred the germinative power of the cocoa seed is lost by the time the seeds arrive in this country from the East Indies, the Leaf Disease Regulations absolutely prohibiting the importation from our nearest neighbours such as Natal, Mauritius, India or Ceylon. It is, however, apparent to all that this risk must be taken and we have no doubt but that H. M. Commissioner, recognising the urgency of the case, will at once accede to the Chamber Committee's proposals.

TO ALL PARTS OF ASIA, AFRICA, AMERICA AND OCEANIA.

Seeds & Plants of Commercial Products.

Hevea Brasiliensis.—Orders being booked for the coming crop, August-September delivery 1901 ; booking necessary before the end of April ; quantities of 100,000 and over at special low rates. Plants available all the year round. 100,000 and over at special low rates. A leading Rubber planter in Sumatra, who purchased 50,000 seeds in 1899, and 100,000 in 1900, writes us, under date 15th November, 1900:—"I received your letter of 20th October, from which I learn that you added another case of 5,000 seeds to replace the loss, &c. I am satisfied hereby, and even after this adding I am satisfied by the whole delivery of this year."

Castilloa Elastica.—True superior variety cultivated in Mexico, seeds from specially reserved old untapped trees. Orders booked for August-September delivery, 1901, booking necessary before the end of March ; large quantities on special terms ; Plants in Wardian cases.

Manihot Glaziovii.—Seeds and Plants available all the year round, 100,000 and over at special low rates. A Mexican planter, in sending an order for this seed, wrote on the 22nd August, 1900:—"If they arrive fresh and germinate easily I may send you larger orders, as they are for high ground where the Castilloa does not thrive."

Kickxia Elastica.—(*Funtumia Elastica*).—Seeds and Plants, orders booked. (Lagos rubber.)

Ficus Elastica.—Seeds available in May-June ; booking necessary before the end of March ; also plants.

Urceola Esculenta and **U. Elastica.**—Same as above. (Burma rubber.)

Parameria Glandulifera.—Orders booked for seeds for January-February delivery ; also plants; immediate booking necessary. (A good rubber creeper of Malacca.)

Landolphia Kirkii.—Seeds in July-August, early booking necessary. Plants can be supplied all the year round. (A highly-recommended species.)

Chonemorpha Macrophylla.—Seeds and Plants ; orders booked. (A very valuable rubber-yielding creeper.)

Mimusops Globosa and Payena Leerii.—Seeds and plants in July-August, booking necessary before April.

Achras Sapota, Willughbeia Firma, W. Edulis and other **Rubber and Gutta Percha yielding** Trees and Creepers, Seeds and Plants.

Cinnamomum Zeylanicum (Cinnamon superior variety). New crop of seed in April to June, booking necessary before the end of February ; also plants.

Coffea Arabica, Liberian Hybrid and **Maragogipe Hybrid.**—New crop March-April ; immediate booking necessary.

Cinchona Ledgeriana.—Seeds now ready, also other varieties.

Seeds and Plants of Nutmeg, Clove, Sandalwood (white and red), Pepper, Cardamom, Vanilla, Cacao, Tea, Coca, Fibre, Medicinal and Fruit Trees, Shade and Timber Trees, Eucalyptus various varieties, also Palms, Bulbs, Orchids, &c.

Our enlarged Descriptive Price List of Tropical Seeds and Plants of Commercial Products of Foreign countries for 1901-1902, now being prepared, and will be ready in a few months.

"SOUTH AFRICA."—The great authority on South African affairs of 25th March, 1899, says:—"An interesting Catalogue reaches us from the East. It is issued by WILLIAM BROTHERS, Tropical Seed Merchants, of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbing. We recommend the great Powers and Concessionaries under them to go to William Brothers."

Price List of Seeds and Plants for CEYLON use, post free, on application.

Our new Descriptive Price Lists of Seeds of Shade Trees for Coffee, Cacao, Tea, Cardamoms &c., Timber Trees, Trees for Avenues, Hedges, Wind and Shelter Belts, Ornamental Trees, Shrubs and Climbing Plants ; and Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons, Orchids, Bulbs, Dracænas, now being prepared, and will be ready shortly.

Special Arrangements made with foreign Governments, Botanical and Agricultural Departments, Planters and others for supplying seeds and plants of Commercial Products in large quantities.

Agents in London:—MESSRS. P. W. WOOLLEY & Co., 90, Lower Thames Street.

Agent in Colombo, Ceylon:—E. B. CREASY, Esq.

Telegraphic Address:
WILLIAM, VEYANGODA, CEYLON.
Lieber's, A.I. and A.B.C. Codes used.

J. P. WILLIAM & BROTHERS,
Tropical Seed Merchants,
HENARATGODA, CEYLON.

A FLORAL DISPLAY.

We were very much struck, during a few days' stay at the Sanitarium recently, with the rich display of flower on a shrubby specimen of the "Strobilanthes" or "Nelu"—which we learn from Mr. Nock to be *Strobilanthes gossypinus*, an introduction from the Nilgiris. Hence, we do not find it entered in Trimen's "Flora," although he gives a long list of "Nelus" and much interesting information derived from Mr. T. Farr who is a special authority on the habits, and particularly the flowering of these plants, from his long residence in our hill country and habits of observation in respect of much concerning local natural history, botany, &c. The shrub we refer to with its profusion—a perfect covering of flowers—is certainly a notable addition to our hill gardens. Mr. Nock reports that a plant of it was got from the Nilgiris about twelve or fourteen years ago, and having propagated it from cuttings, he sent it out as an ornamental plant. "It has flowered in Ceylon before; but this year it has flowered very generally." One of the most beautiful of local varieties is "Strobilanthes pulcherrimus" and is thus referred to by Trimen:—

"Montane region, 4000-7000 feet; gregarious, rather rare. Ambagamuwa; Madulkelle; Elk and Horton Plains, abundant. Fl. November-Feb.; pale pink-violet, cal. bright pink.

"A lovely plant when in blossom, the whole inflorescence densely covered with long pink-purple spreading gland-tipped hairs, causing a rose-coloured halo in the sunlight. This is too striking a plant to be overlooked when in flower, and it is pretty certain that there was no general flowering between the seasons 1881-2 and 1893-4.

"The Nilgiri plant referred to this by Wight, and figured in Wight, Ic. t. 1507, is different, *S. amabilis*, Clarke, and is said to be even more beautiful.

Beddome in writing of the Flora of the Nilagiri district" makes special reference to the "Nelus" and speaks of some of them (sessilis, Kunthianus) as "often gregarious and covering several acres in extent, and when out in flower is one sheet of blue, and some people say that it is from this that the Nilagiris, or Blue Hills, derive their name." But of S. gossypinus, pulcherrimus and some others he "says they are well worthy of introduction into gardens and hothouses as among the most beautiful plants found on these hills."

PEARLING OFF WESTRALIA.

A VALUABLE PEARL: PEARLERS' PARALYSIS.

Broome, Sept. 10.—Mr. A E Gummow's pearling skipper brought to his employer today a beautiful pearl, absolutely perfect in shape and lustre, weighing 63 grains. The stone is valued at about £600.

Several divers have been paralysed here lately. One, a young fellow named Tillen, who recently undertook diving, stayed down below too long, and was totally paralysed. The doctor, however, has hopes of pulling him round.

London, Sept. 14.—Pearlshells.—The pearlshell market is firm. Australian have all been sold at from par to 10s advance, but West Australian inferior are cheaper.—*Perth Herald.*

MOSQUITOS' NETS AND MALARIA.

Calcutta, Oct. 8.—The experiment has been sanctioned of supplying mosquito curtains to the men of the R G A doing duty at the River Forts, Rangoon, to ascertain whether any reduction in malarial fever amongst them can be thereby effected.—*M Mail*, Oct. 9.

ALGERIAN EXPERIENCE: THE MOSQUITO'S BREEDING-GROUND.

In a paper read to the Académie des Sciences, Paris, M Billet shows that the malaria fever of Constantine, Algeria, is due to the anopheles mosquito. It begins regularly at the end of June, when these mosquitoes appear in the unhealthy spots. Mr. John Chamberlain, an American, believes that the Mosquito does not always hatch its young in pools, but sometimes makes shift with heavy grass and thick woodlands. In such places the food of the larvæ, decaying vegetable matter, is abundant.—*Globe*, Sept. 20.

MOSQUITOES VIRULENT IN LONDON.

The mosquito has again appeared in London, and his bite is more vicious than ever. Every summer and autumn, the victims of the mosquito become more and more disfigured. The swelling caused is now often as big as a duck's egg. The eye, head, hands, and legs are attacked. The cause is attributed to the neglect of the authorities to drain the marshy ground and running brooks in the suburbs, which, with the growth of London, become more and more filthy, and are the breeding beds of the mosquito or gnat. Unless something is done to clear out these beds, London before long will be as mosquito-ridden as Italy.—*Daily Express*, Sept. 19.

PLANTING "CASTILLOA ELASTICA" IN OPEN PATHWAYS.

By Francis Child Nicholas, Ph. D.

[To the Editor of *India Rubber World*:] On the rubber estates belonging to The Sonth American Land and Exploration Co., Limited, the following results have been obtained: Rubber trees (*Castilloa elastica*) on the company's property in the Sierra Nevada de Santa Marta of Colombia are now two years old. The company has had the advantage of almost nnlimited lands for its operations. The seeds were collected in Costa Rica, and reached the property in fair condition; after their arrival, planting was commenced almost immediately. The plan adopted was to cut pathways through the forests by the side of streams, and along rivers. The seeds having spronted before they reached the property, there was urgent necessity to plant in haste.

The seeds were put in the gronnd abont the middle of Jnne, 1899, and the paths were cnt with a view of maintaining a deep shade to protect the yonng trees for the first four months, Jnly, Angnst, and a part of September, being dry and hot in that region. It was intended, when the antnmn rains should set in, to cut away overhanging trees and underbrush for the purpose of providing sufficient sun and plenty of air for the devleopment of the yonng trees. Where the seedlings were too close together, cross paths were to have been made for transplanting. Before this plan could be carried out, the civil war, so lately disastrous in Columbia, made it necessary to suspend operations, and for eighteen months the yonng rubber trees were almost abandoned. The only thing that could be done was to clean away the dead leaves, which falling from surrounding

trees, threatened to smother the seedlings; but even this work was not thorough, and for months at a time the yonng rubber trees were without any care.

Work was resnmed on the company's plantations during the spring and early summer of the present year, and is now being regularly carried on. It was found on cleaning up the rubber plantation that, while losses had been heavy, there were thousands of "young rnbber trees," and that some of them were doing remarkably well, showing the first developments of that enormons length of trunk, found among trees of the forest which have grown upwards until the sunlight above the woodlands has been reached—a condition that produces a great length of trunk for breeding, promising pounds of rubber where less favourable trees would yield only ounces. Many varied conditions of development were found at the company's plantations, the most important being as follows: Trees on moist, but not wet land, where the snrrounding forest had been opened to allow a fair amount of snnlight, but not enough to burn the yonng trees, were the best. At such places many of the trees presented a growth sufficiently vigorons to promise the development of strong rubber producing trees withont any further attention. After these the most favourable were those trees growing on moist land, but with the sunlight and free circnlation of the air impeded by the surrounding forests these, however, were doing well, and while their growth was not phenomenal it was very satisfactory. Trees showing a rather unfavorable development were those on moist ground bnt too mnch in the open sun. Growth had been vigorous, but there were too many sunburned buds to give much promise of successful matnrity. Of very poor development were trees growing in rather dry places in the hot sun. Many of these were dead the few that remained were very small, some being only two or three inches high. Of very bad appearance were those trees which were on rather dry land in the deep shade, almost entirely cut off from the snn. Nearly all of these were dead, among the very few remaining alive none were vigorous. many had not progressed beyond the first stages of growth, though wood was forming where the tender shoot had been, they were simply dwarfed trees, that had never progressed after the cotyledons had been absorbed.

It appears from these results, that under ordinary circumstances, the *Castilloa elastica*

REQUIRES FOR ITS BEST DEVELOPMENT

damp soil, open shade, and some sunlight. The best trees on the plantations of the South American Land and Exploration Co., Limited, at their Sierra Nevada de Santa Marta properties, are on rather damp land, and have had abont one hour's full sunlight each day. The very favourable results that have been obtained on these plantations, after subjecting them to nearly eighteen months' abandonment, is to my mind strong evidence that the best method for planting *Castilloa elastica* is along open pathways through the forests which enable the planter to make an adjustment of shade and sunlight suitable to the special requirements of the locality selected for planting; and further I am fully convinced that to clear all the land, and keep it clean is a useless expense, that a series of pathways intersecting at right angles will give quite as many trees to the acre as on cleared land and, that under some climatic conditions at least, too much sun will burn the tender buds of young rubber trees, and, influencing older trees, will harden the bark, thereby checking the flow of *latex* through the ducts, which in *Castilloa elastica* are just under the bark, a condition which when the bark is too hard may impair the tree's capacity to produce rubber.

While I advocate open pathways for *Castilloa elastica*, jnctice to all conditions requires a brief notice of results obtained at

PLANTATIONS IN JAMAICA,

owned by the same company. These plantations are in Portland parish, where rains are excessive, the ground usually saturated with water, and penetrating fogs are frequent. Here the most vigorous among the young rubber trees are those where there is an abundance of sunlight. At places where there is some shade, the trees are vigorons and healthy, but are not so large as those in the more open places, their leaves are a deeper green, and perhaps they are rather more healthy than those grown in the sun. Trees which were planted where there is a very limited amount af sun, are straggling and nnhealthy. In the few places where there is little, if any sun, the trees are nearly all dead.

The advantages of open pathways were demonstrated in Jamaica; for, on my last annnal inspection of the company's properties, it was a simple matter to order that overhanging branches should be cut away to provide sufficient sun to meet the requirements of this region, and at present all the company's trees in Jamaica are growing vigoronsly.

These results furnish strong evidence that *Castilloa elastica* requires an adjustment of sunlight and shade, varying with the climate, and the geological conditions of the region that has been selected for planting. Whether the best means of providing this adjustment is to be fonnd in open pathways, is, perhaps, not fully proved; but at any rate they have given good resnlts at the plantations which are being developed under my direction.—*India Rubber World*, September 1st.

SEED IMPORTATION FOR CENTRAL AFRICA.

A special meeting of the B C A Chamber of Agriculture and Commerce was held on Wednesday afternoon to consider a motion with reference to the importation of seed from countries prohibited under the present coffee leaf disease regnlations. There were present:—Messrs. Beaton, Metcalfe, Hynde, Stark, Luke, Partridge, Lloyd, and MacMorland, Secretary. Being a special meeting the Chairman oalled npon Mr Hynde to make his motion. Mr Hynde moved the adoption of the scheme which we publish below and supported it for the following reasons;—

He stated that it was qnite evident that there was a want of stamina in the coffee, and while he did not attribute the bad condition of many of the ooffee plantations to this cause alone, but thought that the recent labour troubles, bug and borer, had a great deal to do with the weakening plants; still there was no doubt that a large influx of new seed was necessary. He pointed out that hitherto seed had been only imported from Jamaica, and that many of their importations were failures. The Government scheme had not worked out, while valuable time was being lost. Importing seed from Jamaica meant that we were importing from one little island, and from ono particular district of that island, whereas it was essential to get new seeds from widely different places. Especially was it necessary to get some of the seeds from the Indian ooffee districts. It was also necessary to import shade seeds. Under the present regulations we had been compelled to make experiments with new seeds, and these experiments had been costly in the extreme, and in many cases had ended in failure. Such experiments were unnecessary when tested shade trees conld be imported direct from the Indian coffee districts under proper safeguards. It was further absolutely necessary to import new economic plants and many of these could only be got from prohibited countries. There would be, in many cases, no danger as they could be got from districts where no coffee had been grown, and where the disease was not likely to be. It was a question, he thought, for the planters to decide whether they were willing to take the risk. He proposed a scheme in which every precaution which could be sngested by science and experience would be taken against the in-

troduction of leaf disease, and he thought that with these precautions we might well take the risk. The gravity of the situation demanded that some such steps should be taken. After some discussion it was unanimously agreed to support Mr Hynde's motion.

DETAILS OF THE SCHEME DECIDED ON.

It is hereby notified for general information that at a special meeting of the Committee of the above Chamber held in the Labour Bureau Offices on 28th August, 1901, Mr. R S Hynde brought forward the following motion, viz., "That H. M. Commissioner and Consul General be asked to temporarily amend, for the period of one year from 1st October next, the Regulations at present in force for the Prevention of the Introduction of Coffee Leaf Disease into this Protectorate to the following effect:—

1. That a Committee consisting of the Resident Government Medical Officer, the Secretary of the B. C. A. Chamber of Agriculture and Commerce, and one elected member of the Chamber, be formed to specially consider applications to import economic seeds from countries at present prohibited under the Coffee Leaf Disease Regulations of 1894.

2. Anyone desiring to import seeds for economic purposes, from countries at present prohibited under these Regulations, must *first* make written application to this Committee. Should their application be approved they may then import the seed, but it must be addressed to the care of the Committee and all charges paid to Blantyre.

3. The Committee will then take such steps towards disinfecting the seed as they may deem necessary, and after disinfection the seed will be forwarded to the applicant without delay, the applicant paying all charges for carriage if such be necessary.

4. Applicants must agree to waive any claims against the Committee for any loss or damage arising from delay, the disinfecting process, or any other cause, while the seed is being dealt with by the Committee.

5. Applicants must engage to carry out any other precautions which the Committee may think fit to prescribe and the Committee must give written notice of special precautions to particular cases when agreeing in applications.

PRECAUTIONS.

The Committee will take the following among other precautions:—

1. Coffee seed will only be allowed to be imported from a prohibited country as cherry-dried.

2. The Committee will cause the pulp to be removed and it, along with all packing material, will be incinerated under their supervision. The seed will then be further chemically disinfected.

3. Other seeds will be treated in a similar manner according to the degree of danger, and special instructions, which must be adhered to by all applicants, may be issued at the discretion of the Committee in special cases."

The above scheme was unanimously approved of by the Committee owing to the urgent need for the importation of new seeds of economic plants and it was decided to publish the scheme before the Annual General Meeting and to request members to lodge any objections they may have to its adoption by the Chamber on or before the General Meeting called for the 18th September.

It is hereby notified therefore that members are requested to signify their approval or otherwise of the above scheme on or before the 18th September. Members who cannot attend the meeting personally are requested to send their opinions on the subject and to indicate their vote to the Secretary of the Chamber Committee. (Signed) J. MacMorland, Secretary.
—*Central African Times*, August 31st.

GOOD CULTIVATION NEARLY AS EFFECTIVE AS RAINFALL.

In a letter to the Department concerning his experience in farm and orchard work at Ellerston, Mr J Stephens says:—"I have followed the advice of the *Agricultural Gazette* in respect to thorough cultivation of crops, and in pruning and working among fruit-trees, and I have often raised good crops in both farm and orchard in very dry seasons. I consider good cultivation amongst growing crops nearly equal to rainfall."—*Agricultural Gazette of New South Wales.*

COFFEE AND BLACK BUG.

A correspondent writes to us:—Government is making enquiries of the planters on the Nilgiris as to the damage done to coffee trees by black bug, from which many estates have suffered severely. Planters will be interested to know that all hybrid Maragogipe plants in the Mekanaad District are freefrom the pest. This cross seems to be immune.—*M Mail,* Oct. 16.

PEARLS.

Mr C Burt, of Victoria square, has in his possession a number of pearls obtained from Shark's Bay, Western Australia, which he has been informed are of most uncommon size and rare value. His attention was directed a short while ago to an illustration of a specimen ⅞ in. in length which was valued at £600. Until then he had not regarded his own as of any considerable worth, but several jewellers in the city have since told him that they are beautiful specimens and of immense value, and he intends sending them to England for sale. The largest is a cluster 1½ in. long, and contains some hundreds of small round pearls; another is of purer quality about half the size; a third cluster consists of three pearls almost circular, each about ⅜ in. in diameter. There are also two large single ones and three smaller clusters.—*S A Register*, Oct. 2.

The most famous pearl discovery in Australia of late years is that known as the Southern Cross. It consists of a cluster of nine pearls in the shape of a crucifix, and is almost perfect in proportion. This freak of nature was picked up at low water on the Lacipede Islands by a beachcomber named Clark; it was last sold for £10,000.—Ibid, Sept. 26

Not a hundred miles from Piccadilly-circut there is a sight at present to be seen in a jeweller's window calculated to afford mucs food for the cynical. Preserved in spirits of wine is a large oyster, whose succulen body beloved in its fresh state by the gourmet, has taken a yellow parchment-like appearance, which irresistibly recalls the unholy horrors one seen in a hospital museum. Close to the sickly-coloured flesh of the bivalve is a large pearl, milky and lustrous, its beauty contrasting oddly with the dead hideousness which adheres to the shell by it, and underneath is a card which informs the spectator that 'the pearl if it grows large enough kills the oyster.' Nature must have been in a malicious mood when she 'started in the pearl line.' It is nothing short of ironical of her to have ordained that the

diseased mollusc should bestow upon the world as a result of its ailment that 'white wealth of the sea,' which, from the night when Cleopatra feasted with Antony to the present time. human beings have valued as the queenliest of gems. For who is there who is not aware that the finest pearl is only, as the dictionaries coldy say, 'the calcareous concretions produced by certain molluscs, valued as articles of personal adornment'? And further inquiry proves the fatal card in the jeweller's to be only too accurate: for whether it be as some believe a parasitical growth, or a malignant eruption which attacks an oyster who lives 'not wisely but too well' it is certainly the experience of all pearl-fishers that the shells which bear the most beautiful pearls are those which by their distorted shape and ugly excrescences give most signs of disease in the creature itself. Someone once criticised the Norwegian author Henrik Ibsen as a man 'who mistook every pimple on the face of humanity for a cancer.' But in the matter of the pearl the human race has reversed this and 'gone one better' for we have mistaken the cancer of the oyster for a jewel. But even if he could give the lie to the cynical man of science who would have us believe that we owe these natural wonders to a diseased mollusc, the pearl is at its best but a lowly object, nothing grander in fact than carbonate or silicate of lime. In old days few mortals had such disagreeable knowledge. For the early inhabitants of the globe the pearl was simply a lovely miracle of Nature, and many were the beautiful myths which were current to account for it. But even today 'the treasures of an oyster' are able by sheer loveliness to survive the fatality of fact. Much can be pardoned to beauty, and no one is so impolite as to inquire into the pearl's past.

A perfect pearl is indeed one of the most beautiful objects in the world. But jewellers will tell you that it is hard to come by. First, it must be accurately spherical, and not spoilt in shape by its contact with the shell. And then it must have a faultless 'skin' and a fine 'orient,' which are jewellers' terms for the delicate texture and delicious milky color of the natural product. The "pearl of pearls" is said to be a specimen in the Zosima Museum at Moscow, called La Pellegrina and weighing 28 carats. It is absolutely perfect in form and color. The famous pearl of the Hope collection at South Kensington weighs 3 oz., and has a circumference of 4½ inches, but it is of irregular shape. It is specially in the oyster of the Persian Gulf and that fished in the Straits of Manaar, near Tuticorin, that the finest pearls are found. But there are many other places where they are to be found. Philip the Second of Spain had a pearl, 250 carats in weight, fished off the island of Margarita, in the West Indies, and Columbus found the natives fishing for them all round the Gulf of Mexico. One of the most important industries of the Bahama Islands is the gathering of pink pearls. It is the only place in the world where the variety is found. They are not taken from the oyster shell, but from a shell resembling a large snail shell called a 'conch.' These pearls, when perfect, fetch very high prices, ranging from £10 to £1,000! In the East Indies, whence, as has been said, the world's supply comes, the month of March is the pearling season. The fishing lasts four or five weeks; the boats go 60 or 70 together, beginning work at sunrise and leaving off at noon. The men labor in pairs, one diving naked without apparatus except a 'sinking-stone' while the other holds the cords and the diver, himself descending in his turn when his companion returns wearied to the surface. Hard labor enough, and risky too is the industry, but round it has grown a romance which must be always irresistibly associated with the wondrous chances of the work. The pearl fisher has symbolised for poets those entrancing vicissitudes of fortune which must secretly fascinate even the most sober of the supporters of the Anti-Gambling League. The bard will have it that there are two periods in the ideal pearl-seeker's life:

One, when a beggar he prepares to plunge;
One, when a prince he rises with the pearl.

—*Morning Leader*, Sept. 27.

NEW COMPANY: BRAZILIAN RUBBER TRUST, LIMITED.

Registered on September 28, by Maddisons, 6, Old Jewry, E.C., with a capital of £37,500 in 5s shares. Object, to acquire certain rubber-producing properties in the State of Para, in the Republic of Brazil, to adopt an agreement between the Rubber Estates of Para, Limited, of the one part and T Y Curtis, for the Company, of the other part, and to carry on in Brazil or elsewhere the business of planters, growers, collectors, manufacturers, curers, merchants, salesmen, importers and exporters of and dealers in indiarubber and other articles and substances, timber growers and merchants, and farmers and planters generally. No initial public issue. The first directors (to number not less than two nor more than five) are to be appointed by the subscribers. Qualification, £250 shares. Remuneration, £100 each per annum (£150 for the Chairman,) and a share in the profits (latter not to exceed £1,000 each in any year).—*Financial News*, October 4.

PLANTING IN SAINT LUCIA.

According to the latest report of the Administrator of Saint Lucia, last year was, on the whole, the most prosperous in the history of the colony since the time when sugar was supreme. There were no hurricanes, earthquakes, or fires in populous places, the cocoa crop was the largest ever exported and prices were good for this as well as for sugar, while the coal trade was the largest of any year since Castries became a coaling-station. The Administrator hopes that soon the means of communication may be extended, the cultivation of the land increased, and the harbour improved. "Saint Lucia seems now to be established in a career of prosperity, and I can foresee nothing in the near future which is likely to interfere with it." The total exports amounted to £229,436, of which bunker coal was valued at £124,554, or 54 per cent., while sugar and its products amounted to 24 per cent. and cocoa 17 per cent. The population is very nearly 50,000, and 1900 was the first year in the history of the colony in which no death from snake-bite was recorded.—London *Times*, Sept. 30.

CEYLON AT THE PARIS EXHIBITION.

We give the following extracts from Lord George Hamilton's Report on "the Indian and Ceylon Sections":—

The exhibits of Ceylon occupied the large portion of the eastern side of the Indian Pavilion, as well as a considerable spaoe in the gronnds, which as before mentioned I was able to allot for this purpose. In the Commercial Court the great staple products of the island, such as tea, coffee, cocoa, oinchona, spices, etc., were well represented by exhibits from every important garden and estate in Ceylon, and the adjoining verandah contained a fine collection of plumbago aud graphite, shown by the Morgan Crucible Company, of Battersea.

In the main Ceylon Court the attention of the visitor was immediately arrested hy a jungle trophy, which occnpied a large space in the centre of the court. This trophy, which comprised, among other animals, a full-sized elephant, a leopard, hears, samburs, axis deer, boars, crocodiles, a gigantic python, birds, insects, and characteristic flora, was exoellently arranged by Mr E Gerard, of London, in fonr realistic tableaux. The conception of this impressive exhibit was due to Mr W E Davidson, the secretary of the Ceylon section, and it proved a never-ending source of enjoyment to the crowds who visited the pavilion.

The colleotion of precious stones, exhibited by Mr J Hayward, of Argyll Street, London, attracted special attention. It was the largest and most comprehensive collection of gems of the island that has ever been brought together. The exhibit of this important industry could not have been placed in hetter hands, and Mr Hayward deserves great credit for the success which resnlted from his enterprise and special knowledge. Samples of coir and other fibre prodncts were also shown in this court, as well as silver, ivory, tortoise-shell, and the artistic manufactures of the island. In the gallery above, a large number of paintings and photographs of the people and scenery of Ceylon were exhibited, also excellent examples of art furniture and heautiful curios.

In the grounds of the Ceylon Tca House, a characteristio pavilion, in which tea and coffee in the cnp were sold, soon hecame one of the most fashionable centres of the Exhibition, and it is gratifying to know that the strenuous exertions of Sir William Mitchell and Mr J H Renton, the representatives of the Ceylon planters to make Ceylon tea better known and appreciated in France and the Continent generally, have met with the recognition that the commercial enterprise of the planters so well deserved.

The creditable position taken by Ceylon at the Exhibition is due to the able manner in which the whole of the details were carried out by Sir Montagu Ommanney and Sir C Clementi Smith, aided by Mr W E Davidson, the energetic secretary of the section, Sir W Mitchell, Mr J H Renton, and the other gentlemen Associated with the Ceylon Conrt.

The popularity of the Indian and Ceylon exhibits may be judged hy the fact that not less than six millions of people passed through the pavilion during the period it was opened to the pnhlic. It should be mentioned that the main huildings of the Exhibition, being entirely unlighted had to he closed at dusk, whereas, owing to a wise resolution of my sub-commitee, the Indian and Ceylon Sections were brilliantly lighted hy electricity, and conld thus be kept open later and give admission to the inquisitive crowds who had little else to see after dark.

From the Reports of British Jurors we quote ;—

REPORT BY MR. J. H. RENTON,
British Juror in Class 39: Vegetable Food Products.

COFFEE.—The only exhibitors of this article were Ceylon and the Madras Presidency. The British West Indies were not represented. Notwithstanding the fact that in Ceylon, owing to the ravages of leaf disease, this article is rapidly disappearing from the list of this Colony's products, the exhibits, thongh small in number and from only fonr plantations, were excellent in quality and appearance. One plantation made a very handsome exhibit of Liberian coffee, and the Grand Prix was awarded to Messrs. Lipton, Limited, in this section for their collective exhibit of coffee and cocoa. The United Planters' Association of Southern India made a very good exhibit of coffee, to which a Gold Medal was awarded. Awards were given to all the other exhihitors of coffee.

COCOA.—Ceylon was the only British Colony that made any exhibit in this article; the exhibit, so far as number of exhibitors was concerned, was not to be compared with the large exhibits made hy Ecuador, Guatemala, Salvador, and Mexico; yet the appearance and qnality of the Ceylon cocoa was admitted to be very snperior, and created a favourable impression. It is mnch to he regretted that Trinidad and the other West India Islands made no exhibits. Trinidad cocoa is very much appreciated in France. The export of cocoa from Ceylon has grown from 16,000 cwt. in 1890 to 42,700 cwt. in 1899. Cocoa was exhibited from seven plantations; they all obtained awards.

A very interesting sample of cocoa was shown by the Administrator of the Gold Coast. I nnderstand this was collected from a few experimental trees at Accra. The qnality of this cocoa leaves nothing to be desired and if suitable labonr can be obtained, there is evidently a fnture for this product in West Africa. There will not be a large increase in the export of this article from Ceylon, as mnch more snitable land is not now available in that Colony.

REPORT BY SIR W. W. MITCHELL, C.M.G.,
Member of the Ceylon Execntive Committee;
British Juror in Class 41: Non-Edihle Agricnltnral Prodncts.

Non-edihle agricnltnral prodncts comprised:—

OILS.—Animal and vegetable.

FIBRES.—Cotton, wool, ramie, aloe, coconut, palmyra, and kitnl.

PLANTS.—Medicinal and oleaginous.

France and her colonies were represented by eleven jurors, and the following conntries by one each, viz., Germany, Bnlgaria, United States, Great Britain, Japan, Mexico, Peru, St. Salvador, Hungary and Russia.

The products of the various countries exhibiting under Class 41 were examined in a painstaking manner, and the awards of merit were judicionsly hestowed on the recipients of them; the proceedings of the jury were characterised hy fairness and cordial co-operation throughout.

OILS.—Animal and vegetable.—The exhihits from French manufacturers were all of a high order, hnt notahly in auimal oils, the finest display being made hy M. Artns, 13, Rne Montmartre, Paris.

In vegetable oils, after palm oil, coconut oils occnpied a prominent position amongst the exhibits, and those from Ceylon claimed a leading place, their purity and good colour being pre-eminent. Improvements in machinery have contrihnted towards this, together with care in the selection and preparation of the nuts from which the oil is made. The oil is nsed in the mannfacture of candles, hut it is also largely ntilised in soap-making, principally owing to the peculiar property it possesses of carrying water to ahont sixty per cent. of its weight.

Fair samples of copra (coconut kernel) and oil were exhihited from the South Sea Islands.

A new product is now heing manipulated from the oil expressed from the coconut, called "cocoa-hutter" or "vegetaline," and this edihle substitute for ordinary hutter is free from objectionable smell and without colour other than that artificially imparted to it. This indnstry is heing prosecnted more especially at Marseilles, where there is an extensive trade in expressing the oil from the kernel of the coconut; hut there is every probability of a further development of it elsewhere.

Another industry closely allied to the one above alluded to is that of desiccated coconut. This con-

sists of the nut operated upon by machinery, which cuts it into various sizes from the ribbon to the granulated form. It is used largely for confectionery and domestic purposes, and the principal centre of manufacture is in Ceylon, which sent forward some fine exhibits of it from the Orient Co., and others.

Linseed Oil and Cake.—The Gonrepore Jute Co., Ltd., exhibited good samples of these, and were awarded a Silver Medal.

Cotton-Seed Oil.—Some samples of this useful oil were deserving of interest. The oil is used by soap makers, and as a lubricant; and as the area planted with cotton in America goes on increasing, it has resulted in a large production of seed, from which the oil is expressed, its cheapness enabling it to some extent to replace more costly oils.

Essential Oils.—There were several exhibitors of cinnamon, lemon grass and citronella oils, chiefly from Ceylon. These are used principally for perfuming soap and to a small extent in drugs, and in cooking.

A number of oils used in native medical practice were exhibited. Some of these possess ascertained definite properties, whilst others have traditional repute, but they are of no commercial importance.

Fibres.—Cotton.—The exhibits from the United States, as might be expected, were exceptionally fine, and the award of a Grand Prix for the collective exhibit is one that is well merited for its excellence in every respect. Specimens of cotton from other countries received attention, but all of them represented a growth insignificant as compared with that of the United States of America.

Wool.—The exhibits of wool were numerous and interesting, but those of New South Wales were of surpassing excellence, and the collective exhibit was awarded the Grand Prix.

The Collaroy Company, Ltd., exhibited some fine specimens—one fleece merino ram, two years, growth of wool 368 days, the largest ever shorn in one piece, the texture being remarkably fine, close and very firm and tough. A Grand Prix has been awarded to this exhibit.

The Glen Moan Station.—I. C. Manchee—submitted three very fine samples and a bale of wool weighing 300 lb. this latter being of uniform excellence, long in staple, thick cluster, fine, and very tough in fibre. For this exhibit a Gold Medal was awarded.

These wools serve to show that great advances have been made in scientific agriculture and in producing sheep giving large size and heaviness in the fleece, combined with a high-class wool.

A collective exhibit of flax from Canada claimed attention and approval, and a Gold Medal was awarded.

Aloe.—Many very fine specimens of aloe fibre were exhibited, but those from Mauritius were remarkable for their excellence; those of Messrs. Rougier, Lagane & Goupille were of a stand-out description, and obtained the award of a Gold Medal

Ramie.—Several samples were contributed, which gave evidence of the great value that may rightly be attached to this article in future from a commercial point of view.

Thus far the endeavours to perfect the process of decortication, and to separate the fibre from the substances enclosing it, have only been partially successful. A conference on the subject is about to be held, when it is expected that special efforts will be made for the achievement of what is so much to be desired.

Palmyra fibre and kitul fibre were hown, and attracted the attention of those interested in the brush-making industry.

Coir Fibre, Rope, and Yarn.—These are produced from the husk of the coconut, and a large export trade is done from Ceylon. The finest range of exhibits was contributed by Messrs. C P Hayley & Co., of Galle, to whom was awarded a Gold Medal.

Cinchona.—Some choice specimens of cinchona bark were exhibited, chiefly from Ceylon, and a Gold Medal was awarded to Mr. F G A Lane for succirubra description.

Report by Mr. C. A. Payton, H.M.'s Consul at Calais.,
British Juror in Class 53: Fishing Appliances.

Ceylon.

The Ceylon exhibits were incomplete, a valuable collection of pearls having been lost on the voyage; but some interesting things were shown, including an excellent collection of marine shells from Trincomalee.

Report by Professor C. Le Neve Foster, F.R.S.
British Juror in Class 63: Mines and Quarries.

The Geological Survey of India sent a very excellent collection of economic minerals, decidedly superior in extent and value to that of the Home Government.

Ceylon fared badly. A fine collection of specimens of plumbago had been got together, and then much of the labour was lost owing to the sorry manner in which they were displayed. Magnificent blocks of plumbago were huddled under a counter in a narrow passage, and other specimens were in dirty boxes on the floor uncared for. Printed information and proper explanatory labels were lacking. Plumbago was sacrificed to tea.

"FERGUSON'S CEYLON HANDBOOK AND DIRECTORY, 1901."

(By an ex-Ceylon Colonist.)

"Give us your ideas about it: a post-card will do." I was dreaming that something was being handed to me, light and effervescent, with ice in it, invigorating. I awoke to find before me a huge red tome measuring 3½ inches by 5½ by 8½, weighing exactly 2 kilogrammes—say 4 2-5th lb avoirdupois, and containing 1,403 pages of subject matter, with about 150 pages of advertisements, illustrated and otherwise! Hardly to be dismissed by a post card. The book is divided as follows:—Planting and Agricultural Review; General and Useful; Statistical; Directories; Errata and Addenda; and anything about Ceylon that is not contained within these limits, is not worth knowing. As a reliable book of statistics it has held its own for many years. Its accuracy has never been challenged. Its compilation has been undertaken and accomplished with the most scrupulous care; and with regard to other Directories, if the late lamented Artemus Ward were still in the land of the living, he would certainly say,

Ekalled by few, and excelled by none!

I am not sure that he would not go further The writer certainly has never come across a "Handbook and Directory" the equal of this in completeness of information and accuracy of detail.

In a book of this description a good *Index* is not the least important part, and here we are well-provided, the *Index* covering 44 pages and being exceedingly well-arranged. Take for instance *ad valorem customs duty.* A friend once told me that when he was a youngster in an office, making out some documents, the chief looked over his shoulder and asked. "Are you stamping these with a penny stamp? or *ad valorem*?" The youngster looked up with "I beg your pardon, Sir?" "I asked you, are these to be stamped with a penny stamp? or *ad valorem*?" "Thank you, Sir, I'll take a cup o' coffee" was the impudent reply. Small wonder that that youngster was soon after drinking his coffee on the hill-sides of Ceylon.

The Planting and Agricultural Review is of great value, not alone to the Ceylon planter

but to everyone who is interested in Tropical Agriculture, be it in the Eastern or Western Hemisphere.

General and Useful should be gone through, not for what you expect to find in it; but for the unexpected. There is much useful information that one does not look for usually between the boards of a Directory, *e g.*, Method of Dressing and Softening Skins; a Monograph on Ceylon Woods with matter of interest to others than those who only need planks for tea-chests, Snake-bites and Antidotes; Compass Variations and many other odds and ends of useful knowledge. It should also be a happy hunting ground for those seekers after curious tit-bits of information with which some folks delight to astonish their friends.

Statistics there are in plenty for those who love to read in figures; and these are relieved from their usual dryness by 25 very interesting pages on "Curiosities of our Customs." Here, for instance, we learn that in 1899, nine elephants valued at R15,750, and two cats value R210, were exported. But, what in the name of wonder is Benjamin? It sounds like the name of an American Bar Drink!—and was imported to the value of R16,715. As I suppose we are within almost measurable distance of adopting the Metrical system, I would with all humility suggest that the next issue of this really wonderful work should contain a comparison of British with metrical weights and measures. This rather comes home to one who sends away his produce in Kilogrammes, and gets account sales in Kilogrammes, Piculs, or Cwts., according to the country it is sold in!

The *Directories*, like all else in this volume, are a marvel of detail and accuracy. The Book itself is indispensable not only to Ceylon residents, but to everyone who has any interest or connection whatever with Ceylon, no matter where his domicile and, as I have pointed out above, it contains much information of great value to the cultivator of Tropical products, be he in the East or West.

For my part, whenever I am reading the London *Times*, Whitaker is at my elbow. Whenever I am reading my *Ceylon Observer*, I have beside me for reference "Ferguson's Hand-Book and Directory."

MADRAS ELEPHANT CATCHING OPERATIONS.

The Report received from the Conservator of Forests, Southern Circle, on the conduct of elephant-capturing operations during the year ending the 30th June, 1901, has been submitted to Government. No elephants were captured during the year, as, owing to the additional work thrown on the department in connection with the supply of sleepers to the Madras Railway Company, neither men nor elephants could be spared for the removal of captures. The pits were accordingly kept open in South Coimbatore and North Malabar. In South Malabar, three sambhur and one bear fell into the pits. Of these, the sambhur were all extricated, while the bear was shot. In his endorsement forwarding the report, the Conservator remarks that there is a want of suitable elephants for capturing purposes in South Coimbatore as well as in North Malabar. In its order, Mis. No. 2152, Revenue, dated 15th June, 1899, Government sanctioned the purchase of four elephants for this purpose from the Mysore Darbar at a total approximate cost of R10,000; but this sanction was not acted on, as the elephants on inspection proved to be too old to be of use. The Conservator reported that he was in correspondence with the Conservator of Forests in Mysore and the District Forest officers of North and South Malabar as to whether any good elephants could be hired or purchased, but the Board has no information as to what the results of this correspondence have been. Mr. Gass will be requested to report on the point.—*Madras Mail*, Oct. 7.

PLANTING NOTES.

The Date Palm.—We attract attention to Dr. Bonavia's useful letter on page 331. It may be a question whether date or palmyra should be the palm to plant in our unoccupied Northern regions—probably the latter will stand drought better, but the date should do well on the borders of coast "backwaters" and marshy places.

Trout in New Zealand.—The number of trout hatched at the Masterton fishponds this year is approximately 450,000. This is one of the poorest returns for some years past. There are at presen at the hatcheries about 350,000 fry ready fo distribution. Of this number, 300,000 are browt trout, and the remainder rainbow. About 150,000 brown trout fry will be liberated in the streams in Wellington province this year.—*Auckland News*, September 19.

Planting in the Federated Malay States.—The following is from a despatch dated 1st July 1901 from Sir Frank Swettenham, the High Commissioner for the Federated Malay States to the Secretary of State for the Colonies:—"The direct interests of planters have never been neglected by the Residents of the Malay States, and, while the Government expended large sums, years ago, in experiments with Arabian Coffee, Indian Tea, Cinchona, Pepper and South American Rubbers, it is now, as already explained, constructing great works for the irrigation of 60,000 acres of Rice land, and last year appointed an Officer to superintend an Experimental Plantation and specially to advice on the cultivation of various kinds of Rubber and its extraction from the tree. I believe that the European Planters, who have hitherto gained but poor reward for their determined efforts in the Malay States, fully recognise that they have the warm sympathy of the Government which will continue to afford them all reasonable assistance. The planting of sugar, originally introduced by Chinese, promises great developments with European capital under European management."

TO KEEP THE BUYING PRICES DOWN.

The Belgian Associations of Kassai, in the Congo, whose competition raised the buying prices of indiarubber considerably, have formed a trust to keep the prices down to a moderate level, and they are receiving the support of the Congo State in the matter. —*Daily Mail*, Sept. 12.

Correspondence.

To the Editor.

BOTANIC GARDENS ON THE GOLD COAST, WEST AFRICA.

(Editor, *Tropical Agriculturist*, Colombo, Ceylon.)

Aburi, Gold Coast, Aug. 26.

SIR,—Enclosed please find a list of the plants cultivated in these Gardens, which I thought might be of interest to you.

I am very grateful for the copy of the *Tropical Agriculturist* which I receive regularly through the Colonial Secretary,* and I need scarcely add I find the information it contains most useful.

I very much regret that I have not been able to reciprocate, but I shall always be happy to supply you with any information you may require from this part of the world, if it is in my power.—Yours very faithfully,

W. H. JOHNSON, Curator.

[The list of plants is very interesting and embraces representatives from all parts of the world including Ceylon cinnamon. Among those peculiar to West Africa are the following:—

Abrus precatorius, Acrostichum punctulatum, Alpinia nutans, Anchomanes Hookeri, Angræcum bilobum and imbricatum, Begonia macrostyla, Calamus decratus, Clerodendron fallax, fragrans and splendens, Cola accuminata, (the kola tree), Crinum giganteum, Cyperus esculentus, diffusus and fertilis, Dioscorea prehensilis, Dracaena Godseffiana, Goldieanæ, Elæis guineensis,—(oil palm),) Eriodendron anfractuosum, Eulophia euglosa guineensis and Saundersiana, Funtumia (Kickxia) elastica and africana, (rubber), Garcinia Hanburyana, Gladiolus sp., Gloriosa superba, Gymnogramme lanceolata, Kalanchoe crenata, Landolphia owariensis and florida, (rubbers), Mussaenda erythrophylla, Nephrodium albopunctatum and variabile, Nephrolepis acuta, Psilotum triquetrum, Pteris atrovirens, Solenostemon ocymoides, Spathodea companulata, Strophanthus sp., Tabernæmontana crassa, Thunbergia erecta, Urena lobata, Vanilla crenulata, Vittaria lineata, Voandzia subterranea.—ED. *T.A.*]

CEYLON TEA IN N. AMERICA AND ITS PROSPECTS GENERALLY.

London, Sept. 27th.

DEAR SIR,—I enclose copy of another letter I have written to the Secretary of the Ceylon Association. Much of its contents will have appeared in the *Observer*, but there are a few points which are new.

I see amongst the many suggestions for getting rid of what is called rubbishy tea, is to buy it up and burn it! I think mine, to convert it into brick tea, is better. It appears that, after all the fuss about Japan tea in Canada, she only takes 5,424,000 lbs. per annum. How 10,000,000 lb. is to be captured out of that by Ceylon Greens is a puzzle which Mr Larkin will perhaps be able to solve when he comes back next week. I missed seeing him by a couple of minutes. If Ceylon planters continue their restrictive policy six months longer until the duty is reduced, they will set the industry on its legs again, because there will be an expansion in the home trade. I believe, however, even this is going on satisfactorily, but it will probably be checked by the rise in common tea.

I am not sure whether the statement in the Yokohama Prices Current includes shipments from Kobe, but I will find out. The Japan Blue Book is rather confusing; first they are given in kins, (100th part of a picul) and then the pan-fired and basket-fired are given separately. I shall no doubt find out all about it at the American Consulate and the Colonial Office; perhaps I may find it in the "Encyclopedia Ceylonica." 50 millions from China, 20 from Japan, and 17 from Ceylon and India—make up in all 87 millions.—Yours truly,

C. S.

The Secretary of the Ceylon Association, London;

52, Longridge Road, 25th September, 1901.

DEAR SIR,—In my letter of the 9th inst., I asserted that the importers of Japan tea into America held an impregnable position, from which they could not be ousted by the costly and unpractical methods adopted by the Ceylon Planters' Association.

As this opinion is contrary to that of many intelligent and experienced planters, it will certainly be disputed. I, therefore, think I may as well anticipate criticism, by stating my reasons for making so bold a statement, and, by thus raising the question, give my critics an opportunity of refuting my arguments, if they can do so.

That importers of Japanese tea in America have an advantage of thirty per cent in the difference between 25 pence per yen, and 16 pence per rupee will not be denied. There are none better qualified to appreciate this advantage than Ceylon Planters, for has not the action of the Indian Government in factitiously raising the sterling value of the rupee to the extent named, been, for the last four years, a standing grievance of India and Ceylon Planters?

There is little doubt that Ceylon Planters can, if they choose, make better Green Tea than the Japanese, but to do so, fine-plucked leaves must be used, and as the lower grades are not admitted into America, and cannot be sold elsewhere at prices that would cover the cost of packages and transport, they have to be eliminated, and this adds considerably to the cost of the exportable grades, which I think cannot be less than 36 cents per pound, laid down in Colombo.

That the leaves used in making superior Greens, would, if made into Black Tea, give more profitable results is proved by the fact, that very little Green Tea is now being made in Ceylon, and it looks probable, that there will be even less during the next few months.

Hitherto very little has been publicly written regarding the cost of tea in Japan, except vague statements that the prices of labour having advanced, there, the cost must be greater than in Ceylon. It is very difficult to obtain accurate information on this point, as there are very few merchants here who are interested directly in the trade between Japan and America. I have interviewed every one likely to be able to give me information on the subject, and Mr Comes of Messrs Comes & Co., was the only one I found practically acquainted with it. From him I learned that Japan tea was not sold packed ready for shipment, as in China, India and Ceylon; but was sent to the shipping ports, in a half manufactured state, and there refired, sorted, and packed by exporters, and that the cost of doing this was about five yen per picul. By adding this sum to the market quotations, the price ready for shipment is obtained. This was

* Ordered officially.—ED. *T.A.*

confirmed by Mr Walters, Manager of the Hongkong and Shanghai Banking Corporation, who has been in Japan.

I find by the Yokohama Prices Current of the 13th August, that common teas including re-firing &c., cost 28 yen per picul; this at an exchange of 25d is equal to 5·26d per pound. Good medium tea at 25 yen equals 6·37d, and finest at 40 yen equal 7·52d.

Taking good medium to correspond with the quality usually shipped from Colombo, it would appear that there is not much difference between the cost of Japan, and Ceylon Greens.

It is authoritatively stated that, to capture the Japanese stronghold, it will be necessary to expend a very large sum in advertisements, and that Ceylon Green Tea must be made to resemble in every way Japanese, and moreover, for a considerable time, Ceylon planters will have to carry on the trade on philanthropic, and not on business, principles.

I will not dwell in this letter on the subject of the bonus paid by the "Thirty Committee" of the Planters' Association, because in a letter to the *Financial Times* in April last, copy of which you obtained, I fully explained its nature and object. I would simply ask what effect could the substitution of a couple of million pounds of Green for Black Tea have in counteracting the over-supply to Great Britain?

Those who are old enough to recall the time when China was the only source of supply, will remember that the consumption of Green went *pari passu* with Black.

Outside the producing countries, and North America, who now drinks Green Tea? I gather from the subjoined statement, taken from the Yokohoma Chamber of Commerce Prices Current, that, even in the United States and Canada, the taste for it is diminishing; whilst that for Black, as in all other Anglo-Saxon countries, is increasing.

Is it worth while Ceylon's spending large sums to try and revivify a declining trade?

I learn from Ferguson's "Encyclopedia Ceylonica" that the American campaign costs no less that £20,000 per annum.* This amount if diverted to practical purposes, would pay five per cent dividend on £400,000 of capital.

Your Committee can imagine what this vast sum could be made to do in promoting the con mption of Ceylon tea in Muhammedan cousuries.

It appears that the chief part of the annual cost of the campaign, is the secret services! One year's savings would cover the expense of erecting in Colombo a Brick Tea Factory, to use up those grades which every one, but the Chinese are anxious to get rid of. Those astute people are, I gather from the Ceylon newspapers, beginnin to find out their value.

It would only cost £2,500 per annum to subsidise a Joint Stock Company with a capital of £50,000 to work the factory.—Yours faithfully,

C. SHAND.

* £10,000 per annum is more like the amount: £20,000 is above the total realised for the Cess last year.—Ed. *T.A.*

TOTAL EXPORTS OF JAPAN TEA FOR THE PAST SIX SEASONS.

Shipments.	1900-1901.	1899-1900.	1898-1899.
To U. S. America...	19,859,749	19,846,372	15,947,030
To Canada ..	5,424,678	6,859,829	7,979,284
	1897-1898.	1896-1897.	1895-1896.
To U. S. America..	21,890.958	19,641,751	23,436,023
To Canada ...	5,565,810	7,708,267	6,500,277

You know that of the 84 million pounds of tea imported into America 50 millions is from China—the consumption of tea in the U. S. appears to have made no progress during the last twelve years.

BLANTYRE AND EAST AFRICA, LIMITED.

Dear Sir,—I send under separate cover prospectus of the above Company. It was only begun to be issued by the public yesterday and it remains to be seen whether sufficient capital will be raised. The opening of the Railway to Blantyre would greatly improve the prospects of planters there and I don't think anyone could say the Company was over capitalised. The Nyssaland Coffee Company's estate has not been a success, but there may have been reasons for that such as the opening of too much land at once, and unsuitable sites.—I am, yours truly,

A. L. C.

[We give a brief summary of the prospectus.—Ed. *T.A.*]

Blantyre and East Africa, Limited, has sprung from an amalgamation of some of the best Planting Interests in British Central Africa. The main objects of the Company are the cultivation of coffee, tobacco, rubber, Chillies, Capsicums, sugar, tea, cocoa, camphor, and other products.

Buchanan Brothers.—These early Planters are dead, and their Trustees wish to realise their Assets, and have been willing to accept £21,250—a very reasonable sum—for their extensive interests.

Hynde & Stark have sent the best coffee lately to the London market, and have made large profits on their tobacco. Their senior partner, a man of large experience and much energy, is to be the Company's Manager in Africa.

John W Moir, by properly preparing and grading coffee on the spot, has secured the highest prices in in the South African Market.

The Scottish Central African Syndicate Limited, is a newer Company, whose estates are not fully developed. This Company has been reorganised, and has become the nucleus to which the other estates have been added.

The land under coffee amounts to over 3,000 acres, and only costs the company an average of about £13 5s. per acre or £39,970. There are also included 154,385 acres of uncultivated land costing on average about 1s 4d. per acre, or £10,047, although part of this acreage, being Township blocks, is worth about £100 per acre.

The Shiré Highlands Railway, which has just been contracted for with H. M. Foreign Office, will increase immensely the value of these lands, besides rendering the working of this large Company more economical and more effective.

Central African coffee has already made a great name for itself in the coffee market, and this new Company, with its Experienced Staff. and with the economies and improvements to be effected, should give excellent results and substantial Dividends in the near future, for Coffee is indigenous. the quality is excellent, while labour is plentiful, and costs under twopence per day.

The detailed Prospectus, on page 14, shows an estimated Profit on the first complete year's working of

£3,654, which would permit of a Dividend of 7 per cent on the Ordinary Share Capital called up.

The Directors confidently expect that this profit will be largely increased in succeeding years.

LARGE HARE SHOT AT PUTTALAM.

Puttalam, Oct. 14.

DEAR SIR,—I am sending you by this post the skin of a hare I shot, on the 20th ult., at Nindeniya, 2½ miles from Puttalam town, and shall feel obliged if you can inform me whether you have a record of a hare shot, larger than the one whose skin I send you. The shot caught her full on the head, and the animal, when skinned, was found to be with young. Please forward the skin to the Maha Mudaliyar, Mr S D Bandaranaike, after you have done with it, as he may be able to say something about it, as a better sportsman than he cannot be found in the lowcountry. I have seen him bring down ten, out of a possible 12, snipe, and his estates and forest reserves are always abounding with hare.—Yours very truly,

FRED. GINGER.

[The skin, measuring 21 by 18 inches, certainly looks unusually large. The following is from "Clark's Sport in Ceylon";—

HARES.

The hare found in Ceylon is the "black-necked hare," *lepus nigricollis*. The Sinhalese name is háwá, and the Tamil músal. They are found almost everywhere, but are most common in the sandy coast-forests. In some places in the northern parts they can be kicked out of almost every bush. They also swarm round the tanks and open places and in abandoned over-grown fields in the interior. The best time to go after them is at dusk. The weight of a well-grown one will be from 5 to 8 lb.

Possibly Mr. Clark, as well as the Maha Mudaliyar, may have something to say about this skin.—ED *T.A.*]

Elie House, Colombo, Oct. 17.

DEAR SIR,—I have read with interest Mr. Ginger's letter to you dated 14th instant, *re* the large hare shot by him. From the description given I am inclined to believe that it belongs to a breed called by the natives "Góna Háwa" ("Elk hare"). This species is of an unusual size, and I have come across and shot some on my "owitas" on Attanagalla, but they are very rare. The general opinion is that this large size is due to the result of a mono-birth, and good grazing ground on land abounding with "Undupialy" or "Rabbit leaf" (trefoil). It may also have been one of this species of full growth, if not of venerable age.—Yours truly, S. D. BANDARANAIKA.

CARDAMOMS FOR AUSTRALIA.

Colombo, Oct. 15.

DEAR SIR,—I feel sure there is nothing remarkable in the absence of a direct supply of cardamoms to the Southern Colonies. With such a limited population, a very small quantity of cardamoms would go a long way in Australia. There could not be any inducement to ship except on order and I expect orders would be of a very retail nature,—Yours faithfully,

MERCHANT.

CEYLON TEA ON THE CONTINENT OF EUROPE.

Kandy, Oct. 17.

SIR,—I herein enclose for the information of those interested copy of letter from Mr. J H Renton to Mr. Rosling with reference to Ceylon tea in Sweden, Norway and Denmark.—I am, sir, yours faithfully,

A. PHILIP,
Secretary, "Thirty Committee."

TEA IN SCANDINAVIA.

My dear Rosling,—I have been for the last 12 days in Sweden, Norway and Denmark, and give you herewith impressions of my visit.

SWEDEN.

Ceylon tea has been well introduced into this country, owing to the fact that two or three planters are connected with Sweden, and have introduced the tea and pushed it through their agents and friends. Some ten years ago the Messrs Seton of the Agras began the work, and others have followed, viz., Mr Dickson, who is himself a Swede, the Lethenty Co., and Mr Luck. With the exception of the agents and friends of the Ceylon planters, I found only one other firm importing tea in Stockholm, and this firm has tea only as one of its departments. It is a large firm importing all Colonial produce. I called on two other large firms whose names had been given to me as tea importers, and found they did not touch the article. I was somewhat puzzled therefore as to how the 216,270 kilos of tea consumed in Swedenn got into the country. But when I got to Gothenburg I found nearly as much tea is imported here as in Stockholm, and that tea is imported into Sweden through no less than 22 other ports. Detailed statistics are as under :—

From	1899.	1900.
Norway	1,106 kilos	1,242 kilos
Finland	675 do	3,522 do
Russia	22 do	687 do
Germany	64,598 do	60,618 do
Denmark	55,117 do	52,108 do
Holland	5,659 do	7,820 do
Belgium	7,201 do	14,056 do
Great Britain	67,105 do	76,084 do
France	26 do	223 do
Total	201,509 kilos	216,270 kilos

These statistics give no information as to original country of production. Tea transhipped at Hamburg, Amsterdam and Antwerp for instance, is all entered as coming from Germany, Holland and Belgium, and these countries figure therefore as the countries of export. The population of Sweden is just over five millions. The consumption of about 0·09 English lb. per head is very poor, especially when it is considered that the duty is only 50 öre per kilo., say 3d per English lb. The consumption, however, is increasing slowly. Ten years ago the quantity imported for home consumption was only 80,000 kilos. From careful enquiries, I think, quite one-third of the above quantity of 475,794 English lbs (I should say it was over a third but not a half) is of Ceylon tea. With the exception of the quantty imported by the Messrs. Seton's and Dickson's agents *via* Antwerp and Hamburg, all the rest of the Ceylon tea imported into Sweden is bought in London. Even Messrs. Seton's friends are buying now more in London. The reasons of this are mainly, the London market is cheaper, the dealer gets samples in advance of the auctions and

buys exactly what he wants, and finance is easier. For teas shipped from Colombo the drafts come forward by the mail in 3 weeks' time, and have to be laid at once, whereas the teas themselves are always 7 weeks on the road, sometimes longer. Credit is much abused both in Norway and Sweden. The dealers have to give their clients the grocers a nominal four but generally six months' credit, because private individuals pay their accounts sometimes once in six months, sometimes in a year's time. On teas bought in London the Swedish and Norwegian dealers obtain the usual London terms and are not called upon to pay for the teas till long after their arrival. I called on the following:—

IN STOCKHOLM.

Firm A. General importers of colonial goods with a tea department—has imported direct from Colombo and are quite satisfied with their work, but prefer to buy in London. Use however, mostly China tea and keep Ceylon only for clients who ask for it, are not inclined to go out of the way to push it; think the taste is growing for Ceylon.

B. Tea importers only. Ten or twelve years ago took up Ceylon at the instance of the Messrs. Seton of Preston estate, now purchase only Ceylon and push it entirely. This firm received a grant from the Committee in 1897 I believe, and one through me this year of £100. Last year they expended on general and special advertisements 8,550 kronen say £475, their travellers' expenses were 14,000 kronen, say £777.

In 1901 to date they have expended in general cavertisements, signs to grocers,
apnisters, &c. .. 5,350 kronen =£297
Travellers' expenses .. 10,000 „ =£555

They well deserve our support.

Their imports in 1900 were 61,000 lb. To date 1901 only 25,500 lb but 22,200 are on the way from London, Ceylon and Hamburg. They anticipate that they will import about 6,000 lb less in 1901 than in 1900 as they got a large quantity just at the end of last year, but they are buying more in London this year, and quantity from there will be 10,000 lb over last year and correspondingly less from Ceylon direct.

C. A small limited Company called Ceylon Plantage le Depôten commenced by a coffee broker who unfortunately has failed by plunging in coffee. This firm has been in existence four years—and seems to have spent a great deal on advertising in many ingenious ways. To instance one, they have a number of neat little match boxes, which they give away. Up to date they say they have lost money. They are supplied exclusively by the Lethenty Estates Company from London. I have promised them a grant for next year, and will, if I have funds, make them a contribution for this. As vouchers were not ready for me, their accounts are to follow me.

D. Mr Dickson's agent has Dickson's tea and placards in three or four shops, but he is working mainly through private persons, and has only commenced his general propaganda.

E. Is a firm of first-class grocers with five shops in Stockholm. The head of the firm, a born Englishman, but now a naturalised Swede has a nephew, a proprietor in Ceylon. This firm some three years ago imported packet teas direct from Colombo, but now they have their own Ceylon Packets packeted in London. They also run a pure Indian blend—and give the preference to the Indian. The London firm which supplies them having a branch in Calcutta naturally tries to push Indian teas in preference to Ceylon. This Calcutta firm seems to be doing a good business in Norway, Sweden and Denmark.

As we have quite enough firms in Stockho'm making Ceylon teas their speciality I did not try to get any of the Gothenburg firms to take it up specially and push it. A special return is issued yearly of Gothenburg trade which gives amongst other things the quantity imported by each firm. The return for 1900 is not out yet, but in 1899, 73,000 kilos were imported by 14 different firms. Two of these only are purely tea firms, the others are general Colonial produce importers. I called on the principal—entirely tea.

F. By far the biggest importer has correspondents in Colombo, but buys now always in London, is favourably disposed towards Ceylon tea and buys about 20,000 lb. per annum, which is about one-third of his total import.

G. 2nd largest importer, total import though only 15,000 lb. buys principally Ceylon and Indian, all in London.

H. Imports 12,000 lb., principal retail mostly China from Hamburg, uses Ceylon for mixing purposes.

I. Entirely tea, imports only 2,000 lb ! all China—was at one time the biggest tea business n Sweden.

J. General importer, buys blends from a firm in *Putney*, London, S.W. !!!

NORWAY.

The consumption in Norway is as follows:—

From	1899. Kilos.	1900. Kilos.
Sweden	1,656	4,799
Denmark	20,340	18,805
Germany	51,881	58,571
Holland	2,091	1,640
Belgium	7,262	907
Great Britain	34,030	38,960
East India, China and Asia	673	807
Other Countries ..	51	47
Russia	108	339
Total..	118,095	124,875

Last year the consumption was 274,725 English pounds. The population is 2,000,000, so the consumption per head of 0·13 of an English lb. is better than Sweden, and this notwithstanding the fact that the duty on tea in Norway is 2 kronen per kilo, or about 1s 2d per lb. The Norwegian importers have petitioned their Parliament on successive occasions to have the duty reduced. The justice of their demand has been acknowledged, but the Government cannot do without the revenue. The dealers say if the duty were only reduced by half, the consumption would be doubled. I have not been able to find out through whom most of the tea comes, and think Hamburg and Copenhagen dealers must supply the retail firms direct. I hear there is a firm in Bergen importing a good deal of tea direct from London, but I could only learn of five firms in Christiania interesting themselves to any extent in tea. Of these five three are general colonial produce houses.

K. A big firm, tea is a minor article with them, and they confine their purchases almost entirely to China. What little Ceylon they get, they buy in Bremen or Hamburg.

L. Also another large firm with whom tea is only a minor article, all of which they buy in London, and they sell principally their Assam blend.

M. A smaller firm who took up Ceylon tea in 1897 and import it in packets direct from Colombo. They advertised and pushed it vigorously in 1898-99, and last year. It is gradually displacing their China, as this year they will import two-thirds Ceylon, one-third China, but their total imports will not exceed 7,000 lb. this year. They got a grant last year, and I have promised one for next to include this year's expenditure.

N. A new firm started two years ago and entirely tea. They are to put up and run a pure Ceylon tea of three qualities, are getting special placards for it and circulars. Their first purchases of Ceylon have just been made, and we will see what they can do.

O. Is the Christiania branch of the Stockholm firm *B.* They opened in Christiania four years ago—and only sell Ceylon. Have worked up the importation to 8,000lb. but have lost money every year. They have advertised very largely, but the expensive part of the business is their travellers as it does not pay in travel only for tea. If I have funds available I will give them something towards their expenditure this year and have promised them £50 for next. I fancy that nearly one-third of the tea sold in Norway is Ceylon tea, if not sold pure it is sold in blends. I have urged on the dealers the importance of getting grocers to reduce their prices. Tea especially in Sweden is far too dear; until it is much cheaper the public will not take to it. The drink of these countries is, of course, coffee. I fear nothing can be done at present in the way of tea rooms. The customs of these countries do not lend themselves to afternoon coffee, and consequently not afternoon tea. The cafés are deserted between 4 and 6, as this is the dinner hour of the dwellers in towns. Coffee is drunk at breakfast and at supper. In a few families tea is taken at 4 o'clock occasionally, but when it is drunk it is at 9 or 10 o'clock at night. The peasants and fishermen will have no tea. Still the taste for tea is growing, and there is no reason why the ¾ million lb. of tea drunk now in these two countries should not be all Ceylon.

DENMARK.

In Denmark much more tea per head is drunk. Quantity entered for home consumption in 1900 was 910,000 Danish lb. The total import was 1,490,000 Danish lb., but as Copenhagen is a free port, a good deal is transhipped there for Russia and Sweden and Norway. The steamers of the East Asiatic Company receive the same privileges as steamers flying the Russian flag. The import for home consumption in 1899 was 900,000 Danish lb. but, in 1898 it was 990,000 Danish lb. The population is a little over 2½ millions, of which nearly half a million is resident in Copenhagen and suburbs. 900,000 Danish lb. equal to say 990,000 English lb. is equivalent to 0·35 per lb. per head of the population. I am convinced that the Copenhagen dealers supply the retailers in South of Sweden, so that Denmark offers a good field for Ceylon tea. In Copenhagen I see no less than 5 large shops and 3 smaller ones selling only tea. In addition to these special tea businesses, tea is displayed in many grocers' windows. But in Denmark Ceylon has made but a very small beggining, and where other than China is used it is all Indian, that is used and prepared. The usual story is, it keeps better and is much better adapted for mixing.

IN COPENHAGEN

there are four large Colonial Importers with tea departments. Four firms selling tea only wholesale, and five semi-wholesale, with good warehouses and offices but with retail shops as well.

1. The oldest and most important in the first group—do put (*sic*) Ceylon tea, but frankly told me they only kept it if it was asked for. They had sold China tea for 50 years and did not intend to sell any other, if they could help it.

2. Keep only China—and their tea is a very minor article.

3. A small house principally coffee and exclusively China tea.

4. One of the partners in this firm has been in Colombo, and has correspondents there. Their business is principally other articles, but he takes a keen interest in Ceylon tea and has tried to open up a trade in it though he finds it very difficult to do so.

The second group, all keep Ceylon tea and buy it in London or through Bremen firms. One of them gives all the preferable Indian. But another tells me he imports 100,000 lb. of which one-third is Ceylon and Indian, mostly Ceylon bought in the London market. I have hopes that in time this man will take up and push Ceylon. The 3rd firm have agreed to make Ceylon a special feature in their trade, to run it in packets in 3 qualities under a special label and will issue special circulars. I am to contribute the cost of placards and circulars, and this is a beginning at any rate of the 3rd group, I found one who said he sold practically no China. He keeps to the China designations but his teas are all Indian blends. He maintains the public do not care for Ceylon. The other four firms all keep Ceylon, but use it mainly in their blends. The demand for pure Ceylon is they say very small. They buy all their Indians and Ceylon teas in London; one of them has the agency for the *Santhol Mission* teas from Bengal!

You will see from the above that the work in the interests of Ceylon tea was begun in Sweden and Norway long ago; and that what has been done there, has been through the initiative of the individual Ceylon Planter. The increase in the consumption has been very slow, but continuous, and the work has been a very uphill work. We have made a beginning in Denmark and I hope it will not be either so slow or such hard work as in Norway and Sweden.

The duty on tea in Denmark is 66 öre per kilo say 3¾d. per English lbs.—Yours, &c.,

J. H. RENTON.

Copenhagen, September 26th, 1901.

THE DEAF HEAR.—No. 479 of *the Illustrated World* of 626, Chiswick High Road, London, W., England contains a desctiption of a remarkable Cure for Deafness and Head Noises which may be carried out at the patient's home, and which is said to be a certain cure. This number will be sent free to any deaf persons sending their address to the Editor.

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company	paid p. sh.	Buy-ers.	Sell-ers.	Transaction
Agra Ouvah Estates Co., Ltd.	500	—	900	—
Ceylon Tea and Coconut Estates	500	—	—	..
Castlereagh Tea Co., Ltd.	100	—	—	—
Ceylon Provincial Estates Co. Ltd.	—	—	610	—
Claremont Estates Co., Ltd.	100	—	—	—
Clunes Tea Co., Ltd.	100	40	50	—
Clyde Estates Co., Ltd.	100	—	—	..
Doomoo Tea Co., of Ceylon Ltd.	100	—	65	—
Drayton Estate Co., Ltd.	100	...	...	...
Eila Tea Co., of Ceylon, Ltd.	100	—	30	—
Estates Co of Uva, Ltd.	500	.	250	—
Gangawatta	500	—	950	..
Glasgow Estate Co., Ltd.	100	—	—	—
Great Western Tea Co., Ltd.	500	610	—	—
Hapugabalande Tea Estate Co.	200	—	—	..
High Forests Estates Co., Ltd	500	...	550	..
Do part paid	400	—	450	—
Horekelly Estates Co., Ltd.	100	—	85	—
Kalutara Co., Ltd.	500	—	250	—
Kandyan Hills Co., Ltd.	100	—	40	—
Kanapediwatte Ltd.	100	—	85	—
Kelani Tea Garden Co., Ltd.	100	—	25	—
Kirklees Estates Co., Ltd.	100	—	120	...
Knavesmire Estates Co., Ltd.	100	—	60	—
Maha Uva Estates Co., Ltd	500	375	400	—
Mocha Tea Co., of Ceylon, Ltd.	500	—	—	700
Nahavilla Estate Co., Ltd.	500	—	300	...
Neboda Tea., Co. Ltd	500	..	500	—
Palmerston Tea Co., Ltd.	500	—	400	—
Penrhos Estates Co., Ltd.	100	—	90	—
Pitakanda Tea Company	500	—	—	—
Pine Hill Estate Co., Ltd.	60	35	40	—
Putupaula Tea Co., Ltd.	100	—	—	...
Ratwatte Cocoa Co., Ltd.	500	—	250	—
Raylgam Tea Co. Ltd.	100	—	40	...
Roeberry Tea Co., Ltd.	100	—	70	—
Ruanwella Tea Co., Ltd.	100	—	—	30
St. Helier's Tea Co., Ltd.	500	—	500	...
Talgaswela Tea Co., Ltd.	100	—	30	...
Do 7 per cent Prefs.	100	..	70	...
Tonacombe Estate Co., Ltd.	500	325	..	...
Udugama Tea & Timber Co., Ltd.	50	..	..	...
Union Estate Co., Ltd.	500	...	200	..
Upper Maskeliya Estates Co. Ltd.	500	—	—	..
Uvakellie Tea Co., of Ceylon, Ltd.	100	—	—	—
Vogan Tea Co., Ltd.	100	—	—	55
WanarajahTea Co.,Ltd.	500	..	1000	—
Yataderiya Tea Co., Ltd.	100	—	250	—

CEYLON COMMERCIAL COMPANIES.

Company	paid p. sh.	Buy-ers.	Sell-ers.	Transaction
Adam's Peak Hotel Co., Ltd.	100	...	30	—
Bristol Hotel Co., Ltd.	100	110	115	112½
Do 7 per cent Debts.	100	105	—	—
Ceylon Gen. Steam Navgtn. Co., Ltd.	100	—	225	..
Ceylon Superaeration Ltd.	100	135	—	137½
Colombo Apothecaries' Co. Ltd.	100	135	—	...
Colombo Assembly Rooms Co., Ltd.	20	—	..	...
Do prefs.	20	...	..	—
Colombo Fort Land and Building Co., Ltd.	100	85	90	—
Colombo Hotels Company	100	295	—	295
Galle Face Hotel Co., Ltd.	100	—	—	175
K[illegible]dy Hotels Co., Ltd.	100	...	117·50	..
M[illegible] Lavinia Hotel Co., Ltd.	500	250	350	—
New Colombo Ice Co., Ltd.	100	...	90	190
Nuwara Eliya Hotels Co., Ltd.	30	..	30	..
Do 7 per cent prefs.	100	—	107	...
Public Hall Co., Ltd.	20	12½	14	...

LONDON COMPANIES.*

Company	paid p. sh.	Buy-ers.	Sell-ers.	Transaction
Alliance Tea Co., of Ceylon, Ltd.	10	...	8—9	..
Anglo-Ceylon General Estates Co.	100	..	55—60	..
Associated Estates Co., of Ceylon	10	—	1½—2½	...
Do. 6 per cent prefs.	10	..	3—5	..
Ceylon Proprietary Co.	1	...	¾—½	..
Ceylon Tea Plantation Co., Ltd.	10	..	23¼—24	..
Dimbula Valley Co., Ltd.	5	..	5—5½	..
Do prefs.	5	..	5—6	...
Eastern Produce & Estates Co. Ltd.	5	3¼	3¼—3¾	..
Ederapolla Tea Co., Ltd.	10	...	6—8	...
Imperial Tea Estates Co., Ltd.	10	...	4—4½	4
Kelani Valley Tea Asscn., Ltd.	5	..	3—5	...
Kintyre Estates Co., Ltd.	10	...	6—8	..
Lanka Plantation Co., Ltd.	10	..	3½—4½	..
Nahalma Estates Co.,Ltd.	1	—	nom	..
New Dimbula Co., Ltd.	1	...	2¾—3	..
Nuwara Eliya Tea Estate Co., Ld.	10	—	9½—10	10
Ouvah Coffee Co., Ltd.	10	..	6—7	...
Ragalla Tea Estates Co., Ltd.	10	..	11—13	..
Scottish Coylon Tea Co.,Ltd.	10	—	10—15	...
Spring Valley Tea Co., Ltd.	10	...	2—5	..
Standard Tea Co., Ltd.	5	..	10—12	...
The Shell Transport and Trading Company, Ltd.			2⅞—3⅛	—
Ukuwella Estates Co., Ltd.	5	—	par	—
Yatiyantota Ceylon Tea Co., Ltd.	10	4¾	4½—5	...
Do. pref. 6 o/o	10	..	9—10	..

BY ORDER OF THE COMMITTEE

Colombo, Nov. 1st, 1901.

* Latest London Prices.

RAINFALL RETURN FOR COLOMBO.

(*Supplied by the Surveyor-General.*)

	1896.	1897.	1898.	1899.	1900	Av of 31yrs.	1901
	Inch	Inch	Inch	Inch.	Inch.	Inch.	Inch.
January ..	2·92	3·81	2·32	6·98	3·72	3·24	11·91
February ..	0·35	1·68	1·98	2·78	0·63	1·89	3·55
March ..	5·64	3·66	4·21	0·88	3·71	4·75	5·12
April ..	5·93	10·97	22·31	6·66	15·12	11·43	8·71
May ..	9·31	8·30	5·80	17·73	10·63	12·04	6·23
June ..	8·37	10·14	10·94	9·23	7·83	8·35	5·93
July	2·85	5·24	6·15	1·11	6·77	4·30	4·52
August ..	6·35	9·09	6·97	0·62	7·35	3·79	0·46
September	10·99	4·58	6·90	1·48	4·00	4·93	3·93
October ..	16·78	4·71	20·60	12·99	9·47	14·26	3·80*
November..	19.81	11·66	17·38	8·58	9·25	12·55	
December..	11·76	8·89	3·05	4·44	5·20	6·35	
Total..	101·06	82·73	103·11	73·48	83·68	88·03	54·21

* From 1st to 30th Oct. 3·80 inch, that is up to 9·30 a.m on the 31st Oct.—ED. *C.O.*

DOUBLE-HEADED BROWN TROUT.—Freaks of nature, in the shape of two brown trout each with two heads, and two fish of the same species joined at the fins, in Siamese twins fashion, were exhibited at the Mining Exchange on Monday by Mr. Robert Taylor, of the Acclimatisation Society. The fish were obtained in the hatching boxes at Lake Wendouree, and were three weeks old.—*Melbourne Leader*, Oct. 5.

ECUADOR—exported during 1900, 1,103,511 pounds of India-rubber, valued at 1,076,068 sucres (=about $460,000, gold). These figures are larger than the average for a good many years past. The exports from Guayaquil in 1876 reached 1,013,000 pounds, after which there was a heavy falling off. only 380,300 pounds having been exported in 1893. A recent visitor to the "India Rubber World" offices is about to begin, in company with some other Americans, the planting of *Castilloa elastica* rubber near Guayaquil.—*India Rubber World*, October 1.

COLOMBO PRICE CURRENT.

(*Furnished by the Chamber of Commerce.*)

EXPORTS

Colombo, Oct 28th, 1901.

CARDAMOMS :—
All round parcel, well bleached per lb. R1·55
Do. dull medium do. R1·40
Special assortment, 0 and 1 only do. R1·90
Seeds do. R1·40

CINCHONA BARK :—
Per unit of Sulphate of Quinine 9c—1½ to 3 o/o.

CINNAMON :—
Ordinary assortment per lb. 51c.
Nos. 1 and 2 only per lb. 55c.
Nos. 3 and 4 only per lb. 44c.

CINNAMON CHIPS :—
Per candy of 560 lb R77·50

COCOA :—
Finest estate red; unpicked per cwt R50
Medium do do None
Bright native unpicked and undried R45
Ordinary do do do None

COCONUTS—(husked).
Selected per thousand R52·00
Ordinary ,, R45·00
Smalls ,, R35·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R75·00
Do in bags None

COCONUT (Desiccated).
Assorted all grades per lb 17½c

COCONUT OIL—
Dealers' Oil per cwt R17·50.
Coconut Oil in ordinary packages f. o. b. per ton R380·00

COFFEE.—
Plantation Estate Parchment on the spot per bus. None.
Plantation Estate Coffee f.o.b. (ready) per cwt—None.
Native Coffee, f.o.b per cwt.—None.

CITRONELLA OIL—
Ready do per lb.—44c

COPRA—
Boat Copra per candy of 560 lb. R59·00
Calpentyn Copra do do R60 00
Cart do do do R56·00
Estate do do do R59·00

CROTON SEED per cwt—R15·00

EBONY—
Sound per ton at Govt. depot—R200,00 Per Govt. sales of 2nd September.
Inferior R150·00 Per Govt. sales of 2nd September.

FIBRES—
Coconut Bristle No 1 per cwt R11·50
Do ,, 2 ,, None
Do mattress ,, 1 ,, 3·50
Do ,, 2 ,, 2 00
Coir Yarn, Kogalla ,, 1 to 8 15·00
Do Colombo ,, 1 to 8 11·50
Kitool all sizes ,, None
Palmyrah ,, None

PEPPER—Black per lb None

PLUMBAGO—
Large lumps per ton R550
Ordinary lumps do 530
Chips do 350 Fine qualities scarce.
Dust do 200
Do (Flying) do 120

SAPANWOOD— per ton None.

SATINWOOD (ordinary) per cubic ft. 3·10
Do do per cubic ft. None.

TEA—	High Grown Average.	Medium Average.	Low Grown Average.
Broken Pekoe and Broken	cts	cts	cts
Orange Pekoe per lb	57	45	41
Orange Pekoe do	48	43	36
Pekoe do	42	38	33
Pekoe Souchong do	36	33	30
Pekoe Fannings do	39	26	29
Broken mixed—dust, &c	24	18	22

CEYLON EXPORTS AND DISTRIBUTION FOR SEASONS 1900 AND 1901.

COUNTRIES	Black Tea. 1901 lbs.	Black Tea. 1900 lbs.	Green Tea. lbs.	Coffee—cwts. Plantation	Coffee—cwts. N'tive	Coffee—cwts. Total.	Cocoa cwts.	C'moms lbs.	Cinnamon Bales lbs.	Cinnamon Chips. lbs.	Coconut Oil. 1901 cwt	Coconut Oil. 1900 cwts	Copra cwts.	Desiccated Coconut lb.	Poonac. cwts.	Coconuts. No.	Plumbago. 1901 cwts.	Plumbago. 1900 cwts.	Fibre cwts
To U K. ..	83404219	90751577	156549	6439	..	6439	29001	210273	580650	205128	180185	187221	17231	7859992	7960	10094863	159171	104647	54590
,, Austria ..	43876	11302	..	..	..	...	45	..	6040	17920	5030	7281	25252	86733	...	..	...	2	...
,, Belgium ...	14516	12855	...	53	..	53	100	6000	71900	93000	5752	1326	58539	457391	61940	196105	159?7	27450	19960
,, France ..	223603	249952	...	204	...	204	30	1469	42100	3920	602	..	69728	7740	500	406	395	102	541
,, Germany ..	448 94	285448	...	51	..	51	1424	1243	671965	463574	9534	10373	122039	1044500	71253	621765	41003	42357	1 262
,, Holland ..	18494	2000	...	...	..	..	..	..	16000	86240	3716	...	..	58500	..	..	202	912	753
,, Italy ..	11218	5032	...	..	..	..	..	480	112600	82432	5238	..	..	150	...	7842	100	...	14
,, Russia ..	7676506	6927566	...	127	...	127	123	764	..	..	134	..	42494	..	...	..	8713	1004	..
,, Spain ..	...	15130	...	..	...	..	..	..	258500	50000	..	..	...	10370	...	..	...	..	..
,, Sweden ..	46143	56285	..	...	..	..	..	..	...	14200	199	...	9025	6430	..	..	204	80	..
,, Turkey ..	27869	22202	...	...	..	...	...	..	...	...	..	...	...	...	...	...	..	...	..
,, India ..	939642	670693	16124	68	..	68	2	117073	..	.	106521	68063	941	..	...	511000	506	1045	19
,, Australia ..	17560670	13741724	1714	2117	10	2127	226	...	9256	59628	165	634	...	68 518	...	..	431	1919	4972
,, America ..	2073107	3581117	488544	155	..	155	1096	2781	289300	2 837	14030	48129	1	867344	...	..	132035	116525	2237
,, Africa ..	233176	161743	..	..	..	..	..	1056	5000	..	76	42	..	17823	2	1427240	...	...	80
,, China ..	2503639	1004357	4853	35	...	35	149	5872	15100	..	1114	932	..	74334	..	1200	..	14	..
,, Singapore ..	112292	99029	...	..	..	...	1516	559	7700	..	2006	4039	...	..	...	...	..	...	853
,, Mauritius ..	29376	700	..	20	..	20	...	..	..	..	..	..	...	..	..	...	..	..	.
,, Malta ..	268308	365923	..	..	...	..	..	..	...	..	..	..	..	...	..	..	..	..	..
Total export from 1st Jan. to 28th Oct 1901	115734848	117967635	667784	9269	10	9279	33712	365757	2031111	1110879	334005	328647	340150	11171845	41655	12861481	352677	296493	94614

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Price Current, London, October 2nd, 1901.)

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine cwt.	Fair to fine dry ..	44s a 80s
Zanzibar & Hepatic ,,	Common to good ..	20s a 60s
ARROWROOT (Natal) lb.	Fair to fine .	3½d a 6¼d
BEES' WAX, cwt.		
Zanzibar & Bombay, White ,,	Good to fine	£6 a £7 10s
Yellow ,,	Fair ,,	£5 5s a £6 10s
Madagascar ,,	Dark to good palish	£5 17/6d a £5 10s
CAMPHOR, Formosa ,,	Crude and semi refined	160s a 165s
Japan ,,	Fair average quality ..	170s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	2s 3d a 2s 4d
	Middling, stalky & lean	1s 5d a 1s 7d
Ceylon.—Mysore ,,	Fair to fine plump ..	1s 4d a 2s 9d
	Seeds .	1s 2d a 2s 5d
,, Tellicherry ,,	Good to fine ..	2s 11d a 3s
	Brownish .	2s 6d
,, Long ,,	Shelly to good ..	6d a 2s 6d
,, Mangalore ,,	Med brown to good bold	2s 2d a 3s 3d
CASTOR OIL, Calcutta ,,	1sts and 2nds ..	3½d a 4d
CHILLIES, Zanzibar cwt.	Dull to fine bright ...	35s a 45s
CINCHONA BARK.—lb. Ceylon	Ledgeriana Orig. Stem	2d a 5½d
	Crown, Renewed	5d a 7d
	Orig. Stem	3¾d a 5½d
	Red Orig. Stem	2½d a 4¼d
	Renewed	2d a 5¾d
	Root	3¾d a 4d
CINNAMON, Ceylon 1sts per lb.	Ordinary to fine quill	9½d a 1s 6d
2nds	,, ,,	8½d a 1s 5d
3rds	,, ,,	8½d a 1s 4d
4ths	,, ,,	8d a 11d
Chips	,, ,,	[illegible]¼d a 10d
CLOVES, Penang lb.	Dull to fine bright bold	4½d a 6½d
Amboyna ..	Dull to fine	4¾d a 5½d
Zanzibar and Pemba	Good and fine bright	4d a 4¼d
	Common dull to fair	3⅝d a 3 15-16d
Stems ..	Fair	1⅝d
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	98s 6d a 121s
	Middling to fine mid ..	76s a 104s
	Low mid. and low grown	
	Smalls	40s a 60s
Native	Good ordinary	30s a 40s
Liberian ,,	Small to bold	27s a 35s
COCOA, Ceylon ,	Bold to fine bold	70s a 88s 6d
	Medium and fair	60s a 67s 6d
	Native	5[illegible]s 6d a [illegible]s 6d
COLOMBO ROOT ,,	Middling to good	10s a 20s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair ..	£13 10s a £18
FIBRE, Brush ,	Ord. to fine long straight	£16 a £19
Cochin ,,	Ordinary to good clean	£20 a £24
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £30
Cochin ,,	,, ,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	17s a 20s
CUTCH ,, ,,	Fair to fine dry	28s a 35s
GINGER, Bengal, rough ,,	Fair	34s
Calicut, Cut A ,,	Good to fine bold	80s a 95s
B & C ,,	Small and medium	46s a 77s
Cochin Rough ,,	Common to fine bold	37s a 41s
	Small and D's	34s a 36s
Japan ,,	Unsplit	38s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	15s a 45s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £18
	Part yellow and mixed	£7 a £8
	Bean and Pea size ditto	70s a £9 2s 6d
	Amber and dk. red bold	£5 10s a £6 7s 6d
	Med. & bold glassy sorts	80s a 100s
Madagascar ,,	Fair to good palish ...	£4 8s a £8
	,, ,, red ..	£4 5s a £9
ARABIC E.I. & Aden ,,	Ordinary to good pale	35s a 58s
Turkey sorts ,,		40s a 45s
Ghatti ,,	Pickings to fine pale ...	12s 6d a 35s
Kurrachee ,,	Good and fine pale ...	52s 6d a 55s
	Reddish to pale selected	30s a 40s
Madras ,,	Dark to fine pale ...	20s a 35s
ASSAFOETIDA ,,	Clean fr. to gd. almonds	60s a 137s 6d
	Ord. stony and blocky	6s a 25s
KINO ,,	Fine bright	1s 3d a 1s 6d
MYRRH, picked ,,	Fair to fine pale	80s a 115s
Aden sorts ,,	Middling to good	50s a 80s
OLIBANUM, drop ,,	Good to fine white	35s a 55s
	Middling to fair	25s a 35s
pickings ,,	Low to good pale	18s a 23s
siftings ,,	Slightly foul to fine	10s 6d a 25s
INDIARUBBER, Assam lb	Good to fine	2s a 2s 4d
	Common to foul & mxd.	7d a 1s 6d
Rangoon	Fair to good clean ...	2s a 2s 4d
Borneo	Common to fine	1s a 2s 3d

	QUALITY.	QUOTATION
INDIARUBBER (Contd)		
Java, Sing. & Penang lb.	Foul to good clean ...	8d a 2s 6d
Mozambique ,,	Good to fine ball ...	2s 6d a 3s 1d
	Ordinary to fair ball ...	1s 10d a 2s 6d
	Low sandy Ball ...	1s 3d a 1s 7d
	Sausage, fair to good ..	1s 6d a 2s 11d
	Liver and Livery ball ..	2s 4d a 3s
Nyassaland	Fair to fine ball ..	1s 3d a 2s 11½d
Madagascar	Fr to fine pinky & white	2s 2d a 2s 6d
	Fair to good black ..	2s a 2s 6d
	Niggers, low to fine ..	7d a 2s
INDIGO, E.I.	Bengal—	
	Shipping mid to gd violet	3s 8d a 4s 6d
	Consuming mid. to gd.	3s 2d a 3s 6d
	Ordinary to mid.	2s 10d a 3s 1d
	Mid. to good Kurpah	2s a 2s 6d
	Low to ordinary	1s 6d a 1s 10d
	Mid. to good Madras	2s a 2s 10d
MACE, Bombay & Penang per lb.	Pale reddish to fine	2s a 3s
	Ordinary to fair	1s 4d a 1s 11d
	Pickings	1s 3d a 1s 4d
MYRABOLANS, Madras cwt	Dark to fine pale UG	5s a 6s
	Fair Coast	5s
Bombay ,,	Jubblepore	5s a 6s 3d
	Bhimlies	4s 2d a 7s 6d
	Rhajpore, &c.	4s 3d a 6s
Bengal ,,	Calcutta	3s 6d a 5s
NUTMEGS— lb.	64's to 57's	2s 4d a 2s 6d
Bombay & Penang ,,	110's to 65's	1s a 2s 1½d
	160's to 130's	6d a 1s
NUTS, ARECA cwt.	Ordinary to fair fresh	14s a 17s
NUX VOMICA, Bombay per cwt.	Ordinary to middling	4s a 5s 6d
Madras	Fair to good bold fresh	7s a 10s 6d
	Small ordinary and fair	5s a 6s 9d
OIL OF ANISEED ,,	Fair merchantable	5s a 5s 1½d
CASSIA ,,	According to analysis	[illegible]
LEMONGRASS ,,	Good flavour & colour	5d a 5¼d
NUTMEG ,,	Dingy to white	1½d a 2d
CINNAMON ,,	Ordinary to fair sweet	2¾d a 1s 6d
CITRONELLE ,,	Bright & good flavour	9½d a 10d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody..	10s a 12s 6d
Zanzibar ,,	Picked clean flat leaf ..	10s a 14s
	,, wiry Mozambique	10s a 11s
PEPPER—(Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ...	5⅞d a 6¼d
Singapore ..	Fair	6d
Acheen & W. C. Penang	Dull to fine	5¾d a 6⅛d
PLUMBAGO, lump cwt.	Fair to fine bright bold	20s a 35s
	Middling to good small	20s a 32s
chips	Dull to fine bright ..	9s a 15s
dust	Ordinary to fine bright	3s 6d a 8s
SAFFLOWER	Good to fine pinky .	65s a 75s
	Inferior to fair .	40s a 60s
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£20 a £[illegible]
Chips ,,	... ...	5s a £8
Madras, Logs ,,	Fair to good flavour ..	£20 a £50
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Ceylon ,,	Fair to good .	£5 a £5 10s
Manila ,,	Rough & rooty to good	£4 10s a £5 15s
Siam ,,	bold smooth...	£7
SEEDLAC cwt.	Ord. dusty to gd. soluble	62s 6d a 65s
SENNA, Tinnevelly lb	Good to fine bold green	4d a 5½d
	Fair greenish	3d a 3¼d
	Common dark and small	1d a 2½d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's	£2 10s a £3 7s 6d
	D's and B's	
	Small ...	
Mergui ,,	Small to bold ..	£6 7s 6d a £6 15s
Mussel ,,	Small to bold ...	22s a 55s
TAMARINDS, Calcutta...	Mid. to fine bl'k not stony	8s a 10s
per cwt. Madras	Stony and inferior ..	5s a 8s
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	16s a 28s
TURMERIC, Bengal cwt.	Fair ..	20s
Madras ,,	Finger fair to fine bold bright	22s a 25s
Do. ,,	Bulbs ..	17s a 18s
Cochin ,,	Finger .	17s 6d a 18s
	Bulbs ..	8s a 8s 6d
VANILLOES— lb.		
Mauritius .. 1sts	Gd. crystallized 3½ a 9 in	14s a 24s
Bourbon ... 2nds	Foxy & reddish 3½ a 8 ,,	13s a 16s 6d
Seychelles 3rds	Lean and inferior ...	8s a 12s
VERMILION lb.	Fine, pure, bright ...	2s 3d
WAX, Japan, squares cwt	Good white hard ...	32s a 3

THE
AGRICULTURAL MAGAZINE,
COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for November :—

Vol. XIII.] NOVEMBER, 1901. [No. 5.

SCHOOL GARDENING IN CEYLON.

THE scheme for establishing gardens in connection with village schools may now be said to be fairly launched. The object of the scheme is threefold: (1) To make the surroundings of school children pleasant and attractive to them; (2) To evoke a healthy interest in the study of plant life and Nature in general, and to encourage methodical observation and reasoning therefrom; and (3) To introduce and extend the cultivation of vegetables and fruits in the localities in which the schools are situated. To this end the gardens will be planted with both ornamental and useful plants.

In order to ensure a constant supply of such plants and seeds as will be required for school gardens, a "stock garden" has been established in the grounds of the late School of Agriculture, Colombo, where vegetables and flowers are kept under cultivation and nurseries of fruit trees maintained. The chief ultimate sources of supply are the Botanic Gardens at Peradeniya and Henaratgoda. This stock garden—no doubt only the first of many—is under the supervision of the Superintendent of School Gardens, but in direct charge of a manager and a small staff of coolies.

The difficulties in selecting sites for school gardens are considerable, for the reason that the grounds which have been allotted to schools were not in the first instance selected with any idea of providing space (for sport and gardening) beyond the bare foundation area for the school building. Indeed, the conditions at present attaching to Government school buildings are far from satisfactory. To begin with, many of the sites are private property given gratuitously by the owners, but for purposes of gardening they are unsuitable owing to their being either too limited in extent, or already fully planted up with perennial trees (such as coconuts), while often they are badly provided as regards soil and water supply. At present there is also some difficulty experienced as a result of the ignorance of the principles of gardening among teachers. There are, however, a number that either from having come in touch with the late School of Agriculture or through previous experience, make very fair amateur gardeners, but they unfortunately often have little scope for gardening, while better favoured teachers are found to have little knowledge of, or no aptitude for horticulture. This latter anomaly will no doubt be remedied in time and suitable m... be brought to suitable sites, but until all Government schools come to stand on Crown land, and a large enough area for all purposes be placed at the disposal of the Department of Public Instruction, there will be many obstacles in the way of school gardening. Once, however, this is brought about, the land will be at the disposal of the school garden authorities to treat as is thought best for the object in view, so that, given a fair water supply the possibilities of gardening should not be wanting.

At present there are in the Western Province six schools (originally selected to be worked by way of experiment) which have established gardens that should in a general way serve as types for other school gardens. There are the schools at Kirriwattuduwa, Jambureliya, Handapangoda, Homagama, Kumbaloluwa, and Kahatuduwa. The first two and last gardens reflect great credit on the teachers, and go to prove that we have among that body, men who are both able and willing to carry out the requirements of the new scheme. The names of these teachers deserve to be mentioned in this account of the initiation of the school garden scheme, and we mention them trusting that their example will be speedily followed by all others who have the welfare of the children and the people of the village at heart, and wish to see their pupils proud of their school.

Kirriwattuduwa—M. D. Peiris.
Kahatuduwa—W. A. Perera.
Jambureliya—M. D. Neris.

OCCASIONAL NOTES.

Mr. Alexander Perera, late Clerk and Foreman Botanic Gardens, Hakgala, has been appointed assistant to the Superintendent of School Gardens. Mr. Perera assumed duties on the 10th October.

The Superintendent of School Gardens made a tour through the North-Western Province during July and September, visiting the schools at Karukuliya, Medagama, Walahapitiya and Nattandia (in the Chilaw district), and Nickaweratiya, Wariapola, Weuda and Watareke in the Kurunegala district.

We have been permitted to look through a new work on "Nature Teaching" by Mr. F. Watts, Government Chemist, Leeward Isles, issued under the authority of Dr. Morris, Director of Agriculture, West Indies. It is really an elementary text-book on Agriculture, in which the lessons are presented in a very practical way calculated to create an interest in the minds of the scholars. We agree with the *Imperial Institute Journal* in thinking that "teaching conducted on these lines should be attended with the best possible results."

The following reference to Agricultural Education occurs in H.E. The Governor's address at the opening of the new session of the Legislative Council on October 18th :—"The School of Agriculture has been closed, and in its stead a scheme has been started for the extension of School Gardens, whereby it is hoped eventually to improve the supply and increase the variety of vegetables and fruits throughout the Island, and to teach just so much practical horticulture and botany to the boys as will really be of use to them in their home life. The progress of this effort will be watched with interset." While in the "Message to the Council" we read: "The School of Agriculture has been closed with a view to its transfer to Kandy. Meantime, as against the expenditure thus saved, provision is made for the encouragement of school gardens, the supervision of which has been entrusted to the late Superintendent of the School of Agriculture."

Among our latest exchanges is the *Agricultural Gazette of New South Wales*, an excellently got up and edited publication, specially well illustrated. In our last number we omitted to mention that the notes on Poultry Parasites were taken over from this paper.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF OCTOBER, 1901.

1	Tuesday ..	·72	17	Thursday ..	Nil
2	Wednesday ...	·07	18	Friday ..	Nil
3	Thursday ..	Nil	19	Saturday ...	Nil
4	Friday ..	Nil	20	Sunday ..	Nil
5	Saturday ..	·16	21	Monday ..	Nil
6	Sunday ..	1.13	22	Tuesday ..	Nil
7	Monday ..	Nil	23	Wedesday ...	Nil
8	Tuesday ..	Nil	24	Thursday ..	·52
9	Wednesday ..	Nil	25	Friday ...	Nil
10	Thursday ..	Nil	26	Saturday ..	Nil
11	Friday ..	Nil	27	Sunday ...	Nil
12	Saturday ..	·16	28	Monday ...	2·21
13	Sunday ...	·07	29	Tuesday ...	·67
14	Monday ..	·34	30	Wednesday	Nil
15	Tuesday ..	·02	31	Thursday ..	·48
16	Wednesday ..	Nil	1	Friday ...	·46

Total. .6·29
Mean. . ·20

Greatest amount of rainfall registered in 24 hours on the 28th Oct. 2·21 inches.

Recorded by C. DRIEBERG.

DIET FOR THE POOR.

Dr. J. L. Vanderstraaten, M.D., late Principal of the Ceylon Medical College, has very thoughtfully sent us some copies of a leaflet on "Diet for the Poor" written by him many years ago for the "Miscellany," and specially draws our attention to the value of the pea or more correctly Pigeon Pea (*Cajanus indicus*), and the facility with which the plant grows, thriving well in the sandy soil in Colombo and round the tank at Nickaweratiya. This pea is the "Dhall" which forms so important an element in the vegetarian diet of the Hindus in India. We have always felt that the value of dhall has never been sufficiently recognised in Ceylon, and some years ago did all in our power to popularise it by distributing seed, and in other ways. While reserving further remarks with reference to this pulse, we here reprint the paper referred to as worthy of perusal, just at this time when a special effort is being made to improve the diet of the people. We would merely add by way of preface that despite the many services which Dr. Vanderstraaten has rendered in connection with sanitation and in other ways, he will always be remembered as the home physician who always spoke with authorit

on questions of domestic economy, and especially on the subject of diet. We now give the paper referred to :—

The subject of "Diet" for persons in health, for the invalid, and for the poorer classes, in particular, is one which will not only be interesting to the readers of the "Miscellany," but be productive of much good to the individual and to the community, if the principles which regulate the supply of nutriment to the body are clearly understood and carried out in practice, daily.

There is no doubt that there is much ignorance and neglect in the daily selection of articles of food, and it is with the object of pointing out what articles have more nutritive value than others that I send you a few notes on the diet of the poorer classes for daily use in health.

The staple article of food in this country is rice, which is plentiful and cheap, within reach of the poorest labourer who earns from twenty-five to thirty-seven cents per diem, and even of the street beggar who accumulates a large quantity from the small handfuls doled out to him from house to house. If the readers of this paper, particularly the Chief Mudaliyars, Ratemahatmeyas, Presidents of Village Tribunals, Headmen, Officials, and Clerks in the various Kachcheries throughout the island could induce the ignorant villagers to cultivate other articles of food, and not to depend upon rice cultivation alone, much destitution and misery could be averted in the remote villages of the interior.

The value of meat is well known, it is true, but its cost is prohibitive, and when indulged in, in the interior it is generally by dishonest means. The flesh of wild boar, elk, deer and smaller game is appreciated, and even the uncivilized denizens of our forests, *the veddahs*, preserve venison in the dry state and eat it with honey; these are nutritious and are "flesh and fat formers." In Batticaloa, Badulla, Hambantota, dry venison called "din ding" is eaten by the better classes in the same way as dry Maldive fish is prepared—with onions, lime juice and chillies. Pork is freely consumed, when obtainable, in the domestic or wild state. Mutton is only consumed in the Northern and Eastern Provinces by the Tamils, and by the better classes of Hindus and Moormen in the larger towns. Beef is forbidden flesh to the *Sivites*, who pride themselves on being strict vegetarians. It is well known that man cannot live on meat alone, but these vegetarians try to convince us that "they live on vegetables alone," which is also an impossibility, as pure and strict vegetarianism cannot keep a person in health and enable him to "live and move" about. These so-called vegetarians consume a large quantity of milk, curds, butter-milk, and clarified butter called "ghee," and many of them eat eggs in curry. The poorer classes eat fish in small quantities in the fresh and in the dry or salted state, and vegetables in large quantities in their curries; and in a dry compound of chopped up vegetables and scraped coconut, flavoured with dry Maldive fish and condiments, called *mellun*.

Europeans, who do not know the composition of the native diets often express their surprise to find strong able-bodied men among those who live on such simple fare as rice and curry, without meat as an ingredient. They do not know that the national dish is a rich compound of "flesh-forming" and "fat-accumulating" substances.

The milky juice of the scraped coconut, which is thoroughly squeezed out after two or three washings, forms an oily ingredient of all curries, one coconut being sufficient for 4 or 5 persons for two meals. In India, where coconuts are very scarce, ghee is used instead, and then the curries are drier in consequence. Most vegetables are consumed accordingly as they are plentiful and in season, without reference to their nutritive qualities. Green vegetables not of the bean tribe are poor in nutritive properties, but all beans and peas are rich in flesh-forming properties and are well calculated to supply the place of animal flesh. During the Franco-German war, the German soldiers were well fed on a portable dry compound of compressed vegetables of the bean tribe, principally the flour of peas, mixed with a small proportion of bacon or lard, all compressed into small cakes, which when boiled with water formed a most nutritious pea-soup.

The stalwart Afghans whom we see in our midst eat pancakes made of wheat flour with a curry composed of "Dholl" or dry peas to which ghee is added, and this is a close imitation of the substance alluded to above as used in the German army.

In this country, all vegetables of the bean tribe grow freely, and it is with the object of suggesting a larger cultivation of them in the interior, so as to induce the villagers to keep them in stock, in their fields and gardens, when the paddy crop fails, that I indite these notes. When rice is abundant they can form the principal ingredient of their curries, and thus a flesh-forming substance can be substituted for meat which is not obtainable.

The dry pea used in India is called "Dholl" or "Dhall," and it can be readily cultivated even in dry sandy localities, for I notice its ready growth and fruitfulness in the sandy soil of the Cinnamon Gardens. The other grains of the pea tribe are ulundu; native peas (pasee pyaru); native bean (thala pyaru), etc., etc.; kurakkan (a millet) can also be used.

In conclusion, I desire to impress one and all who read these notes to spread the knowledge far and wide that all leguminous vegetables, such as beans and peas are the most nutritious, and can supply the place of meat. Green herbs and vegetables contain principally water, and very little actual nutriment. Farinaceous substances such as rice, kurakkan, sweet potatoes, yams, green plantains, breadfruit, jak, with all the various pulses, lentils, beans, peas, etc. should be regularly cultivated as articles of food; the other esculent vegetables as pump-

kins, gourds, cucumbers, are useful, but deficient in nutriment.

[For the benefit of our readers we append a list of the commoner leguminous food products or "pulses," together with their popular names:—

Dolichos biflorus—Horse gram or kollu.

Canavalia ensiformis var. Virosa—Sword bean or awara

Cicer arietinum—Chick pea, common gram or kadala.

Cajanus indicus—Pigeon pea, dhall or paripoo.

Arachis hypogoea—Ground or earthnut or rata-kaju.

Canavalia obtusifolia—Mudu awara.

Phaseolus trilobus—Bin-me.

Phaseolus max—Green gram or mun-eta.

Phaseolus radiatus—Black gram or ulundu.

Vigna cutians—Nil-me and li-me.

Vigna sineusis—Long bean or mē-karal and wandaru-me.

Dolichos lablab—Dambala.

Glycine hispida—The soga bean.

Phaseolus lunatus—Bonchi.

Phaseolus vulgaris—French or kidney bean, bonchi.

Lens esculenta—Lentil.—Ed. *A.M.*]

HOW TO LAY OUT A MARKET GARDEN.

The following hints given by Mr. H. W. Gorrie, Horticulturist, appearing in the *Queensland Agricultural Gazette* should prove useful to our readers who are amateur gardeners. The remarks of the writer apply equally well to Ceylon. For wind belts, however, there are many suitable trees locally available instead of those named, while horse labour is of course a thing unknown here; but all the same, the remarks as to the necessity of so planting as to admit of working up the soil during the growth of the plants is one to be remembered. Mr. Gorrie's directions are particularly useful at this time when School Gardens are being established in the colony.

THE SITE.

In selecting the site of a garden there are four essential points to be considered—namely, water, soil, aspect, and shelter. Of course in growing garden stuff for sale there is also the question of convenience to rail and market to be taken into account.

I have placed water first in my list of essentials, because to attain any degree of success in gardening a good water supply is an absolute necessity. As a rule, the best situation for a garden is on the bank of the creek, or near a lagoon or waterhole; but if none of these are available then you had better sink a well in your garden, for *water you must have.*

True there may be months and months during which no watering will be required; but it is quite certain that sooner or later a dry spell will come, and then, if no water is to be had, you will probably lose the result of months of labour, and perhaps, as in the case of valuable fruit trees, of years.

Therefore, above all things, be certain that, whether you are going to plant twenty acres or only one, you will be able to command a sufficient supply of water in time of need.

Now as to soil—

THE SOIL.

In the first place you may be assured that you cannot have soil too good for gardening; but at the same time, if it is impossible to obtain very rich soil, a liberal and judicious use of manures will ensure the same results, although, of course, at some additional expense. For plants of the Brassica family, such as cabbage and cauliflower, which are greedy feeders, you *must* have rich soil; and, if not rich naturally, it must be made so by liberal manuring.

The deep alluvial flats commonly found near the banks of many of our creeks and rivers are ideal soils for this class of produce, being, as a rule, very rich in humus, and containing all the elements necessary to produce high-class vegetable crops.

A light sandy loam is better for such crops as onions, carrots, &c.; but as it is not always possible to get several kinds of soil within the limits of a garden, it follows that the soil must be made, as far as practicable, to suit each different crop by varying methods of treatment and manuring.

In locating the garden it is well not to have it too far from the dwelling; in fact, if the house is *in* the garden, so much the better.

As to aspect, if the garden is on a slope, the fall should be to the east, but a level site is preferable, as level ground can be more easily and economically worked than a slope: and there is not the danger of both soil and crops being washed away during heavy rains, which is always to be feared when the garden is on a hillside. Then, if possible, the garden should be protected from the prevailing winds by a ridge or a belt of timber. In clearing scrub lands for a garden it is advisable to leave a belt of trees standing on the side from which the prevailing winds blow. This belt should be two or three chains wide, and not sufficiently close to the garden to interfere with the free access of light and air to the plants.

If no natural shelter exists, it is advisable to plant a belt of such trees as camphors, silky oaks, or loquats on the exposed side.

This belt should consist of two or three rows of trees; the trees in the rows not being all in one line, but alternating with each other. This mode of planting breaks the force of the wind more effectually than straight rows. It is, of course, impossible to obtain a garden site fulfilling all the conditions you would like; but get the best you can, and then try to supply yourself what Nature has left out.

PREPARING THE LAND.

In preparing the land for gardening, I should recommend deep working to being with. Get down 15 or 18 inches with a subsoil plough if you can. The advantage of deep working will be chiefly apparent in a long spell of dry weather,

when plants in deep soil will be found to grow and thrive. while others in shallow soils will require constant care and watering to keep them alive.

Having thoroughly broken up your land, the next step is to mark it off in sections for various kinds of vegetables, trees, &c. This will be largely a matter of convenience and circumstances, as no hard-and-fast rule can be laid down, but always bear in mind that even in a small garden horse labour is cheaper than hand labour; therefore, arrange things in such a manner that as much of the work as possible may be done by means of horses.

In this connection, I would say, never sow garden crops of any kind *broadcast*. This is an obsolete custom which should have been done away with long ago.

Always sow or plant in rows, and have the rows far enough apart to enable you to use either horse or hand cultivators between them. By following this system it is easy to keep the ground clean, and also to keep it open, and conserve the moisture by cultivation—a thing which cannot be done where crops are sown broadcast.

This broadcasting of garden crops cannot be too strongly condemned; as it is wasteful, untidy, and unprofitable, except to the seed-sellers, who are the only people benefiting much by it.—*Queensland Agricultural Gazette.*

EXTERNAL PARASITES OF POULTRY.

(*Concluded.*)

The Supposed Connection between "Gapes" and "Lice."—It has been stated that there is a connection between the nematode worm *Syngomus trachealis* (the "red worm" of gamekeepers), that produces "gapes" in fowls and pheasants, and lice. The one is thought to give rise to another in some mysterious way, needless to say there is no connection whatever. The life story of that destructive scourge, the gape worm, has been clearly traced, and it is known that no intermediate host is required for its development.

Feather Eating or Depluming Scabies.—Feather eating in poultry is due to a minute parasitic mite (*Sarcoptes laevis*) at the root of the feathers. It is generally supposed to be due to a "vicious habit" numerous theories, such as idleness and thirst, having been put forward to account for it. There are two kinds of feather eating, viz., Self-feather eating and the plucking of other birds' feathers. The former is chiefly due to the mites living upon and irritating the roots and quills. The form on the fowl makes its appearance about April, and is most prevalent in Spring and Summer. The mites can be easily found amongst the white powdery matter at the base of the quill. The minute young are transmitted during copulation. The fowls pluck out the feathers to destroy the irritation caused by the mites at their base. Lice, also, are partly accountable for feather plucking. The birds in picking off the mites and lice pull out the feathers.

Prevention and Remedies.—As the mite disease is contagious, isolation of the affected bird is the first step, especially if it be a cock. The mites readily yield to treatment with oil of cloves rubbed into the infected area. One part of creosote to twenty of lard or vaseline is still more successful.

Scaly Leg.—This well-known disease is again due to a mite (*Sarcoptes mutans*). This complaint is a serious matter and very prevalent. The scales of the legs and feet become raised and separated, and a chalk-like excretion accumulates between and over them. Rough lumpy crusts are formed, and under these and the scales the mites live and breed. The disease is slightly contagious.

Prevention and Remedies—Isolating of diseased birds is most essential. Removal of the crusts without causing bleeding, and the application of creosote (one part) and lard (twenty parts) will be found sufficient. A mixture of equal parts of flower of sulphur and vaseline rubbed into the limb also cures the complaint. In every case the limb, some days after treatment, should be well cleaned with hotwater and soft soap.

It is most important that any new stock should be examined, especially the cock, and if any signs of parasites are seen they should be cleared off before the birds are given their freedom. If exhibits of poultry infested with parasites were prohibited by Poultry Show Committes, it would force attention to the subject in a way that could not fail to greatly reduce parasitic infestation.—*Agricultural Gazette of N.S. Wales.*

SOME BIBLE PLANTS OF CEYLON.

Ebony (*Diospryus Ebenum.*)—The Hebrew word *Hobnim* which occurs in Ezekiel xxvii. 15 (They brought thee for a present horns of ivory and ebony") has been translated Ebony. The generic name Diospyros was the name of Dalechamps (1586) for the original (Mediterranean) species *D. Lotus* with edible fruit, from *Dios*, Jupiter, and *pyros*, grain. There are twenty known species native to the Island, and nearly all have the dark-coloured heartwood characteristic of true ebony. The ebony tree is chiefly found in the dry region (especially in the north-eastern portion and near Puttalam) where it is common and often gregarious. Though the heartwood (ebony) has been known from distant times, the tree is not mentioned by Hermann and the wood only by Burm who quotes from Grim (1679) as to its medicinal virtues. Rumph records the fact that ebony trees are abundant about "Trinkenemale" (1750), and this is the earliest record. A large export of ebony wood takes place from Ceylon.

The Sycamine tree (which must not be confounded with the Sycamore) is the black mulberry (*Morus nigra*). In Luke xvii. 6, we read: "If ye had faith ye might say to this Sycamine tree be thou plucked out of the root and be thou planted in the sea, and it should obey you." So common and familiar a tree as was the mulberry in Palestine would be peculiarly suited for such an illustration. In North Palestine the mulberry was usually planted in the courtyard and the juice mixed with water in which violets were infused

formed one of the most favourite sherbets. A writer says that in the neighbourhood of Mount Lebanon the land-tax of the peasants is assessed according to the mule-loads of mulberry leaves their little farms yield, so that the cultivation of the tree is directed to favour the growth of the leaves (for feeding silkworms) at the expense of the fruit. Even at the present day the black mulberry is known in Greece as *Sycamenia*.

The Castor-oil tree (*Ricinus communis*) is the gourd of the Scriptures (Hebrew *Kikayar* and the *Kiki* of the Greeks). The plant is referred to in Jonah iv. 6, ("He had prepared a gourd and made it come up over Jonah"), also 7, 9 and 10. "Palma Christi" is another old name for the Caster-oil plant, which belongs to the order *Euphorbiaceæ*. The oil is the chief product and is got from the seeds, though the refuse cake has also a commercial value as a fertilizer. It is said that the modern Jews in London use the oil for their Sabbath lamps. In China a peculiar fungus called *Exidia auriculata*, used in soups, grows on the decaying stems of Ricinus.

AN EXTRAORDINARY DISEASE AFFECTING ARECANUTS.

Agricultural Ledger No. 8 of 1901 consists of a report on the above subject by Dr. George Watt, Reporter on Economic Products to the Government of India. As the arecanut is now being cultivated pretty extensively in the Island, the information contained in the report should prove of much interest to local growers of the so-called "betel nut palm," but as it consists of no less than 179 pages (illustrated), the reproduction of the whole would not be possible in our limited space. We, however, make a few extracts which will give our readers a fair idea of the purport of the report.

The indications of the disease are first, the withering of a few leaflets (pinnae) of one of the innermost leaves. In about 8 or 10 days the whole leaf is seen to be withered. The next leaf to be affected is that immediately outside. In 20 or 30 days the bud and innermost leaves, which still remain green, fall off through the decomposition that is set up at the point of their union to that of the stem. If a tree be felled just before the crown of leaves falls off, it will be found to emit an offensive smell—and the bud when it falls to the ground of its own accord gives out the same smell. It would appear that the older trees become first affected, but that eventually both old and young suffer alike.

What is most alarming is that many Indian cultivators affirm that the disease even extends to coconuts. If this is really so, there is all the more reason for our planters to be forewarned.

Dr. Watt states that he has not had a fair opportunity of investigating this 'very remarkable and alarming disease,' as it had reached its inactive stage when he was deputed to examine it. We may therefore expect further information of fresh research. He, however, suggests that the disease is due to a pathological condition known as *Tyloses*, which may be briefly described as the destruction of the vascular by means of the fundamental tissue, a condition brought about by certain unfavourable climatic conditions. We will not here refer to the opinions of various Botanical writers (Bohm, Mohl, Reess, Sachs) as to the exact nature of *Tyloses*, but will only mention that the observations of Dr. Watt coincide more with the views of Bohm than with those of the other writers.

To briefly explain these views: The Thyllen or cells seen within the pitted vessels of the xylem or wood are produced by a protruding expansion (a kind of hernia) of the adjacent (parenchymatous) cell, which penetrates the pore and either tears through or causes the absorption of the primary membrane of the vessel,—the expansion being supposed to be due to rapid developement of fundamental tissue under the conditions previously referred to,—and pushing through the pores of the pitted vessels as presenting little resistance they practically fill these vessels. And not only are the vessels of the xylem ruptured, but the so-called sporules or vesicles soon produce great caverns and rapidly effect the complete destruction of all the tissues. At this stage fermentive and other saprophytic organisms find a way into the young growing parts, and in a few days the terminal bud and all the young leaves emit an offensive smell. With the fall of the terminal bud the destruction extends to the stem, so that in a marvellously short time, says Dr. Watt, what was a valuable property is converted into a forest of dead stems. This disease in arecanuts is said to be the first record of this extraordinary suicidal degeneration having assumed the form of a serious malady; but it must be viewed (as Dr. Watt thinks) as far more of the nature of a constitutional malady than of an infectious or contagious disease. It clearly originates from climatic conditions, but, most fortunately, conditions (so far as India is concerned) that do not often occur. According to the observations of Dr. Watt the sprouting of the cells of the fundamental tissue is to be explained by a pressing need for moisture in the young growing terminal bud, which impels them to enter the xylem in order to absorb the crude sap. With the filling of the vessels by sprouting fundamental tissue and the consequent interception of circulation, the starvation and death of the terminal bud and ultimately of the whole palm ensues.

The above is the theory of Dr. Watt, and the only means of averting the disease is, in his opinion, more careful cultivation and drainage so as to better control the water supply to the growing plants. He recommends that the trees should be put far enough to admit of the interplanting of other trees, preferably leguminous trees which would tend to preserve the natural balance in the soil that can hardly help being disturbed by planting up forests of arecanuts put 4 to 6 feet apart. It was indeed found that where *Erythrina indica* (Erabodu) was found growing with arecanuts, the liability to disease seemed greatly lessened.

PLANT LIFE.

[A SERIES OF SIMPLE LECTURES INTENDED FOR A CLASS OF JUNIOR STUDENTS.]

LECTURE II.

Respiration or Breathing.—In human beings respiration consists as you know of breathing in and out, and you no doubt further know that what is breathed in is "pure air," and what is breathed out "impure air." Now the essential difference between these two is that the former consists almost entirely of a gas called oxygen and the latter of a gas known as carbonic acid. At present I do not mean to go fully into the nature and properties of these gases as taught us by chemistry, but in order that you may correctly understand the process of respiration, I must tell you one or two facts about them. The air which we breathe consists of a mixture of two gases called oxygen and nitrogen. It is the oxygen of the air which is the essential element for the purpose of respiration, though in breathing we take in both gases. Chemists tell us that nitrogen exists in the atmosphere as a dilutent of the oxygen, as pure oxygen is, so to speak, too strong and by itself is unsuitable for human respiration, just as certain medicines cannot be taken without reducing their strength by the addition of water. As the derivation of the word signifies, oxygen is the "life giver," and when a person is suffocated for want of air, it is the absence of oxygen which causes the loss of life. The chief function of the oxygen which is breathed in may be said to purge the blood of the waste matters which occur in it as the result of wear and tear. Now the element which predominates in the human body (as well as in the plant) is carbon, and hence carbon is the chief waste material found in the blood. It is removed by oxygen combining with it and carrying it away in the combined form of carbonic acid, the compound of carbon and oxygen which is found in the expired breath. This carbonic acid is in any appreciable quantity hurtful to man, that is it is poisonous. Hence the necessity of well-ventilated dwellings. You know how uncomfortable any one feels in a crowded room in which many people are breathing out carbonic acid and there is no free current of air. As a rule his head aches and he begins to feel sick under such circumstances, while some people faint off. These are all indications of the presence of too much carbonic acid in the air. If you have read Indian History you will recall to mind the incident of the Black Hole at Calcutta where a number of English soldiers were crowded into a small room and left to be suffocated. In cleaning old and abandoned wells people have to be careful that there is not a collection of carbonic acid at the bottom which will suffocate them. The gas being heavier than air has a tendency to remain at the bottom of wells and tan pits in which organic matter has been left to decompose. Under such circumstances it is safe to first employ some means for disturbing the gas and mixing it with ordinary air, and one way that this is done is by letting down a bundle of straw by a rope and moving it up and down frequently till the gas has been sufficiently mixed with air to render it less harmful than it would otherwise be. Some people think that if a lighted lamp which is lowered into the well does not go out, it is safe for a man to venture, but though a light may burn in it, the air in the well or pit would still be dangerous for a person to breathe. For the present I think I have told you quite enough about oxygen and carbonic acid, but later on I mean to show you in a practical way something of the properties and behaviour of these gases that would interest you more than the mere description I have given you.

Now the process of respiration in plants is practically the same as that of animals, for in breathing plants take in oxygen and give out carbonic acid just as animals do. You might well ask how is it, if all plants and animals take in oxygen and give out carbonic acid that the atmosphere does not become poisoned, so to speak, by the exhaustion of the oxygen of the air, and the increase of the carbonic acid. Well this is prevented by a provision of nature whereby the composition of the atmosphere is practically the same at all times. But I will not make any further explanation as regards this matter, because I shall have to refer to it more fully under the subject of nutrition.

There is another point I might refer to in order to explain the importance of respiration, namely, the maintaining of the internal heat of the organism, for the combination of oxygen with carbon produce a certain amount of heat which is necessary for a healthy condition. The machinery for respiration is, of course, not the same in plants and animals, no more than it is the same in different animals such as man, fish, insects and so on. You would no doubt like to know by what means plants take in oxygen and give out carbonic acid, or how gases pass in and out. In our case the mouth is the external opening through which respiration takes place. Well, the plant too may be said to have a mouth or rather several mouths. On the leaves, and particularly on the under surface of ordinary leaves, are openings called stomata (each being called a stoma which in Greek signifies a mouth.) These openings are guarded by two more or less curved cells which we may compare to our lips. It is through these stomata that respiration in plants takes place. They are so small that we cannot see them with the naked eye, but we can do so by the aid of the microscope, and I will close my lecture to you to-day by showing you these minute mouths through that instrument. There are other duties required of these stomata which I shall tell you about later on in another connection.

C. D.

DIFFERENT SYSTEMS OF HOUSING CATTLE AND CONSERVING MANURE.

[REPORT BY THE PRINCIPAL, CAWNPORE AGRICULTURAL SCHOOL.]

At the Cawnpore Experiment Station this subject has been under experiment and observation during the past five or six years, and the object

of this bulletin is to place before the public the results of this study accompanied by such general remarks as are thought necessary for a clear understanding of the subject.

Farmyard Manure or Cattle Manure is the chief mainstay of farmers in all countries, and especially in India, where artificial or chemical manures are not practicable at present. It contains all the elements of plant food, nitrogen, phosphoric acid and potash. It also exerts a powerful influence in improving the mechanical texture of the soil: by its application heavy clays are rendered more open and easy to work and light sands get greater coherence and absorptive and retentive power. Of the several plant food ingredients supplied by cattle manure *nitrogen* is by far the most important as it is most deficient in Indian soils, gives the quickest results when applied as manure, and is most difficult and costly to get. So the aim of every farmer should be to get the largest quantity of *nitrogen* in a form readily available for growing crops.

Farmyard manure consists of the dung and urine of cattle and of other farm animals. Its quality and composition will depend upon:—

(1) the kind and condition of the animal producing it;

(2) the quality and quantity of the food supplied;

(3) the care bestowed in collection and preservation.

1. *The Animal.*—Sheep yield more concentrated dung and urine than horses; horses than cattle; and cows than buffaloes. The following table shows the average amount of nitrogen in 100 parts of the excrements of these animals:—

Percentage of nitrogen in animal excrements.

	Dung.	Urine.
Sheep	·07	1·4
Horse	·05	1·2
Cow	·03	0·8

This table brings out clearly not only the difference in the composition of the excrements of different species of animals, but also the fact that in every case the urine is much richer than the dung.

Amongst cattle themselves an adult animal gives a richer manure than a growing calf; a dry cow better than a milking or a pregnant one, because in the latter cases a part of the food is spent in putting forth the fresh growth or in forming the milk.

The food used in feeding the animals is a more important factor in determining the quality of the manure than even their kind or condition. The excrements of the animals of which farm manure is chiefly made up are simply the food sent out of the body after it has performed its functions. So what comes out as manure is what has been put in as food: the richer the food is in valuable ingredients the richer will be the manure. Foods vary very largely in their composition, *i.e.*, in the proportion of nitrogen and other valuable ingredients they contain. The foods given to cattle may be broadly divided into (*a*) the staple straws or green fodders which are given in large quantities, when possible, as much as the animals will eat, and (*b*) the concentrated foods generally given in small quantities at so much a day per head, as cotton seed, rape or mustard cake, juár seed, gram, arhar, lobia, moth, &c. Practically speaking, the bulky foods of the former kind are more or less uniform in their composition and may be taken to contain about 4 lb. of nitrogen in 1,000 lb., while the concentrated foods named contain about 35 to 50 lb. of nitrogen in 1,000 lb. Thus these concentrated foods contain about 10 or 12 times as much nitrogen as the straws, and the manure produced by an animal as well as its health and condition will depend not so much upon the straw or fodder given to it as upon the quantity of concentrated food given daily.

This was clearly shown by the analyses made by Dr. Leather, the Agricultural Chemist to the Government of India, not to speak of the countless analyses that have been made in Europe and America. He took 13 samples of dung, six of which were produced by cattle that were daily getting concentrated food in addition to their straw, and the remaining seven by ordinary village cattle that depend upon grazing and the ordinary ration of straw, but get no concentrated food. It was found that the former six samples contained on the average 0·54 per cent. of nitrogen, against the average of 0·17 per cent. of nitrogen contained by the latter seven samples. That is, the dung of cattle that get concentrated foods contained three times as much nitrogen as the dung of cattle that do not get concentrated food. By allowing concentrated food it is not the dung alone that becomes richer as a manure but the urine also, and that in a greater proportion.

In fact with adult working animals *the whole of the nitrogen and ash constituents* contained in the food eventually comes out into the manure either through the dung or the urine. A clear grasp of this fact by the farmers of England and other advanced countries has not only contributed to their collecting and preserving the excreta of their live stock more and more carefully in proportion to the cost of the food; but has led them to purposely adopt a more liberal feeding of their stock. For they see that the money they spend in the purchase of food secures them a double advantage: stronger and more useful animals, and a richer manure as well.

The care bestowed in Collection and Preservation.—All the dung and all the urine excreted by farm animals, together with any litter that may be used, when well-rotted without undergoing any loss of plant food ingredients, make the best possible farmyard manure. But in the general practice of the cultivators a great part of the dung, almost the whole of that collected during the dry months, is burnt as fuel either in his own household or sold outside to be used as such. Thereby the organic matter of the burnt dung and the nitrogen contained in it are lost. Assuming that a pair of working cattle will produce about 100 maunds of fresh dung per annum during nights and the non-working hours

in the day, and assuming that the cultivator burns ⅔ of this quantity he loses about 11·6 lb. of nitrogen if his cattle do not get concentrated food, and 36 lb. of nitrogen if they do, as in the case of cart bullocks or plough cattle belonging to the better cultivators in the Meerut Division.

The case of this objectionable practice is the want of sufficient fuel. This can be met to a certain extent by live fences, by fuel plantations and by greater attention to those crops that supply in their stalks fuel also, such as arhar, cotton, castor, &c. Under present conditions, however, it cannot be expected that the whole of the dung will be saved.

In certain parts of India, as in parts of the Madras Presidency, the Panjáb and Gujerat, where the fuel supply is better, or where the general agricultural practice is of a higher order, the cultivators do not burn their cattle dung but carefully preserve it to be put to its legitimate use. In this respect the North-Western Provinces and Oudh appears to be the worst, probably on account of the more crowded population and greater scarcity of fuel.

The Urine is weight for weight, a richer Manure than the Dung.—We have seen this already. Dr. Voelcker found one specimen of the urine of Indian working cattle to contain 1·16 per cent. of nitrogen, and Dr. Leather found in another specimen that he analysed, 0·87 per cent. of nitrogen. A pair of working cattle can be taken to void about 4,000 lb. in the year during nights and non-working hours, and this would mean about 35 lb. of nitrogen. But the cultivator in his ordinary practice not only does not utilize it, but allows it to ferment in the sheds and become a nuisance to his cattle and the people living in the house.

The nitrogen in the urine is in the form of urea, and this substance speedily undergoes fermentation and changes into ammonium carbonate and passes off into the air. The loss of nitrogen in this way occurs chiefly in the cattle shed. The strong pungent smell so common in ordinary cattle sheds is due to the formation and evaporation of this ammonium carbonate. The best and surest way of getting most of this nitrogen into the soil is to have the cattle sheds on the land of the farmer, and failing it at least to tether the cattle on the land as long as circumstances and weather will permit. So long as this is not done and cattle are tied in villages a certain part of the nitrogen of the urine cannot but be lost into the air, do what we may; and only a varying fraction of it can be got to do work as manure.

The way commonly adopted in Europe and in the United States of America for securing the urine and preventing the loss of its nitrogen is the use of litter. In this country the want of bedding material is the difficulty, but this can be got over in many places, by careful collection and preservation of the leaves of sugarcane, sheesham, mangoes, jack or other trees, and all kinds of vegetable refuse. The following system of housing cattle, known as the Box system, is well suited for absorbing urine and supplying a well-rotted, rich farm yardmanure.

Box system.—Dig the floor of the ordinary cattle shed about 3 to 3½ feet deep. Plaster the bottom and sides with clay and sprinkle a little ashes and spread a thin layer of whatever litter may be available. The manger for holding the straw and other fodder will be in front of the cattle. For a pair of cattle, the shed may be about 7 feet broad and about 10 feet long. When more than a pair are to be housed a long shed of the above width may be used, allowing at the rate of about 10 feet length of shed for each pair. It may be found convenient to separate the lot of each pair by two or more bamboos put across the shed. Every morning after the cattle have gone out for work the cattle attendant enters the shed, takes the dung dropped during the previous day and night, sprinkles it all over the shed; covers it with the dry part of the bedding in the seed and spreads about 5 or 6 lb. more bedding for each pair of cattle. That part of the bedding which is wet with urine may be spread likewise, before using the fresh bedding of the day. In the rainy weather somewhat more bedding will be necessary, and especially when the roof happens to be leaky. The manure will go on accumulating and the box will get full in about six to eight months according to the size of the cattle and the amount of litter used. When the box is full, the fresh accumulation at the surface may be first removed, and the rest of the manure dug out and carted to the field for immediate use. The manure thus made will be moist, well-rotted and of a rich-brown colour. In the corners and those parts of the shed where the cattle do not tread much, the manure may be dry, mouldy and very hot. A little care on the part of the cattle attendant while sprinkling the wetted straw in the mornings, and his treading down these parts with his foot will less this mouldiness considerably. The unrotted top portion may be put back into the box to be taken out with the next removal of the manure. The box-system of housing cattle is now frequently adopted by the more enterprising farmers of Europe and America for fattening as well as working cattle, one of the objects being to make as large a quantity of rich well-rotted manure as possible. For one thing well-known to the western farmers and practised by them is that if they want a large quantity of manure they must *make* it, and they can if they like. The box system has been under trial at the College Farm in Saidapet (Madras) for the past 22 years and at the Cawnpore and other Indian experimental farms for some years. The cattle have been found to keep perfectly healthy like those in other sheds, and the objection that is raised against it by those who have not tried it, as affecting the feet and health of cattle, is against all experience in India and other countries. By this means about 12,000 lb. or 150 maunds of rich manure can be made from every pair of working cattle.

(To be concluded.)

GENERAL ITEMS.

The temperature, pulse and respiration of domestic animals varies considerably. The artery usually selected for taking the pulse of the horse is the sub-maxillary where it winds around the

lower jaw-bone. On the inner side of the artery may be readily felt and pressed against bone, the number of beats in a minute, the regularity, and the strength are to be noticed as indicating the condition and action of the heart. In the cow the same artery should be felt, the precise location being at the lower edge of the flat muscle on the side of the cheek. When the cow is lying down the metacarpal artery on the back part of the fore fet-lock may be felt conveniently. For both horse and cow the temperature is taken by inserting a clinical thermometer in the rectumen. Care should be taken that mercury is below the normal temperature of the animal, and the thermometer should remain in the gut for three or four minutes. The following table give the normal temperatures etc. of the principal domestic animal. The frequency of the pulse and of respiration even in repose depends somewhat upon the temperature of the air stable, or house, and upon whether the observation is made before or after feeding.

Periods of incubation or latency of disease; anthrax ½ to 1 day; canine distemper 7 to 21 day; cattle plague 5 to 8 days; contagious foot rot 3 to 6 days; foot and mouth disease 2 to 4 days; glanders or facey 7 to 42 days; pleuro-pneumonia 21 to 100 days or more; rabies 10 days to months; tuberculosis 14 to 60 days or more; Variola (cow) 6 to 9 days; Variola (horse) 6 to 8 days; Variola (sheep) 8 to 12 days.

There are many who depend blindly on rainfall for supplying moisture to plants without making any effort to preserve the moisture already in the soil. The following are some useful figures regarding the breeding of cows and horses: Age to begin breeding—horse 4 years, cow 3 years; period of gestation —horse 317, 342, or 419 days, cow 226, 280 or 326 days; duration of aestrum — horse 5 to 7 days, cow 2 to 4 days; return for breeding after parturition—horse 7 to 10 days, cow 21 to 28 days; return to ascertain pregnancy—horse 14 to 21 days, cow 21 to 28 days; age of weaning —horse 5 to 8 months, cow 4 to 6 months; females to each male—mares 20 to 30, cows 20 to 40; period of usefulness for breeding purposes—horse or cow 10 to 12 years.

Here in Ceylon where Guniea grass and Mauritius grass are so largely cultivated (they are indeed the only cultivated fodder crops) we never hear of either being grown *for pasture*. In the *New South Wales' Agricultural Gazette* we find a correspondent recommending that 5 to 6 lbs. of the seed should be sown broadcast for grazing.

Mr. Albert Gale, writing in the *New South Wales' Gazette*, draws attention to the misapprehension that wax is got from flowers, and that bees gather it there from and carry it on their hinder legs. What is seen on the hinder legs is pollen, and bees' wax is really a secretion from the body of the insect.

Mr. J. Stephens, writing with reference to his farm and orchard work says:—"I have followed the advice of the *Agricultural Gazette* (of New South Wales) in respect to thorough cultivation of crops and in pruning and working among fruit trees, and I have often raised good crops in both farm and orchard in very dry seasons. I consider good cultivation amongst growing crops nearly equal to rainfall." This report of a practical test should induce all cultivators to follow the example of Mr. Stephens in keeping the soil in good tilth so that the stores of moisture within so far from being dissipated by evaporation, may be taken advantage of by the roots of growing plants.